

# Chemical Week

June 16, 1951

Price 35 cents



◀ **MCA's Merck**; the time has come to meet industry's toughest challenge: public relations . . . p. 11

**What's ahead** for "wonder metal" titanium . . . . . p. 14

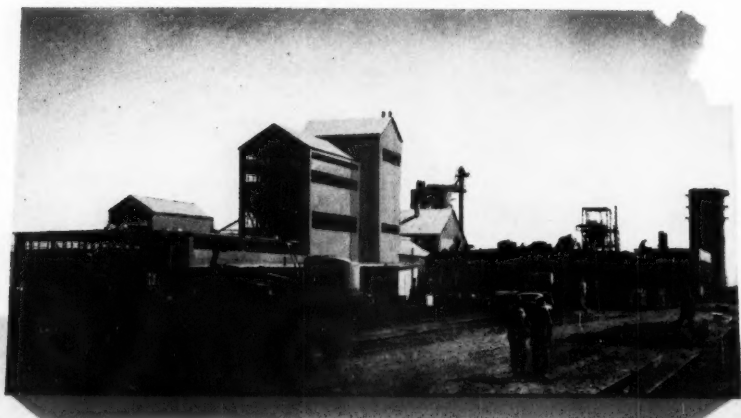
**New tower design** yields better pills, cuts coating needs . . . . p. 23



◀ **CW Camera** sees anti-nerve gas ampoules mass-produced . . . . p. 25

**Chlorophyll-based products** battle old-line deodorants; plum: \$54 million market . . . . . p. 27

*And now – new Westvaco phosphate production*  
*in the heart of America at*  
**LAWRENCE, KANSAS**



By the time you read this, we expect to be shipping Westvaco Phosphates from this newest addition to our coast-to-coast network of processing plants. Installed to meet an urgent need for additional mid-Western capacity, these new facilities will help to alleviate (but by no means eliminate) the continuing shortage of Sodium Phosphates.

Lawrence, Kansas is the latest step in a long range Westvaco program of plant additions and betterments. As recently announced, we have contracted the installation of a fourth electric furnace for the production of elemental Phosphorus at Pocatello, Idaho—making one a year every year since 1948!

While substantially all of our immediate production has been contracted, we will welcome an opportunity to discuss your requirements, if you can be most economically served on phosphates from Carteret, N. J., Lawrence, Kansas or Newark, Calif.; on Caustic Potash from South Charleston, W. Va.; on Natural Ash from Westvaco, Wyoming.

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# Chemical Week

Volume 68      Number 22  
June 16, 1951

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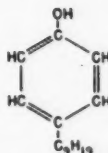
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June 16, 1951

## KOPPERS Nonyl Phenol

*one of a  
series of  
Alkylated Phenols*



**NONYL PHENOL**—one of Koppers series of alkylated phenols—is produced in commercial quantities. It is a slightly viscous, yellow to tan liquid; only very slightly soluble in water, but miscible with common organic solvents.

### REACTIONS

Two of the three normally reactive nuclear positions are unsubstituted in this alkylated phenol; they are subject to such reactions as acylation, sulfonation, nitration, alkylation, and condensation with aldehydes.

The unhindered phenolic hydroxyl group undergoes such reactions as etherification, esterification, vinylation, ethylene oxide condensation, and formation of nonyl phenoxy-acetic acid.

### USEFUL APPLICATIONS

The properties of Nonyl Phenol indicate usefulness in the production of modified phenolic resins, non-ionic surface active agents, lubricating oil additives, antioxidants, plasticizers and agricultural chemicals.

### PROPERTIES

Boiling Range .....	290°–300°C.
Hydroxyl Number (theory 255) .....	250
Specific Gravity, 30°C. ....	.940–.944
Refractive Index, 20°C. ....	1.5118

FOR FURTHER INFORMATION, write to Koppers Co., Inc., Chemical Division

Though supplies are at present limited by the emergency demand, many known possibilities of Nonyl Phenol make it a most interesting chemical for further study in your own laboratories.



KOPPERS COMPANY, INC.

*Chemical Division*

Dept. CI-6-16, Koppers Building, Pittsburgh 19, Pa.

# MONSANTO

CHEMICALS — PLASTICS

## FOR YOUR INFORMATION

Every month Monsanto publishes these pages of pertinent information which may be helpful to you. This issue discusses:

Intermediates  
Hydraulic Fluid

Plasticizer  
Detergents

Additional information on any of these subjects will be provided by any Monsanto Sales Office or in response to your request by coupon or letter.

## Ortho-nitrobiphenyl, low-cost plasticizer, is available now

In this day of "tight" plasticizer supplies, Monsanto Ortho-nitrobiphenyl (ONB) may be the means of solving several of your problems. A low-cost, primary plasticizer, ortho-nitrobiphenyl (also known as ortho-nitrodiphenyl) is compatible with a wide range of materials. And it is available . . . in quantity . . . now!

Ortho-nitrobiphenyl is compatible with the cellulose esters and ethers, polyvinyl chloride, polyvinyl butyral, polyvinyl acetate, styrene, rosin and rosin esters, modified phenolic resins, oil-soluble alkyd resins and vegetable oils. This wide compatibility, plus its low hydrolysis rate and low price, makes ONB an unusually attractive plasticizer.

Most resins, both natural and synthetic, can be plasticized with ONB. The amount of required plasticizer varies with the resins and the use the finished product is to be put to. The volatility of ortho-nitrobiphenyl is less than diethyl phthalate and greater than dibutyl phthalate.

In addition to being an efficient, economical plasticizer, ONB imparts fungicidal properties to textiles coated with ONB-plasticized nitrocellulose, polyvinyl acetate, polyvinyl formal, polyvinyl butyral, cellulose acetate, Vinylite VYHH and styrene.

Ortho-nitrobiphenyl is readily soluble in carbon tetrachloride, mineral spirits, pine oil, turpentine, benzene, acetone, glacial acetic acid and perchlorethylene. It is a good solvent.

For further information on Monsanto Ortho-nitrobiphenyl, contact the nearest Monsanto Sales Office or mail the coupon.

**Send for new catalog** on Monsanto Intermediates. It contains technical information on more than a half-hundred important chemicals, including ortho-nitrobiphenyl. Mail the coupon for your free copy.



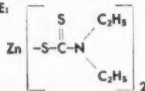
## Research Chemists' Corner

You may find something new here

The three Monsanto chemicals described here are worth exploring for possibilities in developing and improving products . . . in replacing all or part of scarce materials. If you'd like to experiment with them, mail the coupon for samples which will be supplied to you without cost or obligation.

### Zinc diethyldithiocarbamate

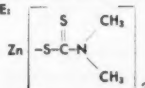
STRUCTURE:



APPEARANCE: White powder.  
SPECIFIC GRAVITY: 1.44 at 25° C.  
MELTING POINT: 173° C. min.  
FINENESS: 99.5% min. thru 200-mesh.  
SOLUBILITY: Soluble in dilute caustic, carbon disulfide, benzene and chloroform.  
HEAT LOSS: 0.5% max.

### Zinc dimethyldithiocarbamate

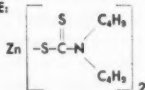
STRUCTURE:



APPEARANCE: White powder.  
SPECIFIC GRAVITY: 1.66 at 25° C.  
MELTING POINT: 248° C. min.  
FINENESS: 99.5% min. thru 200-mesh.  
SOLUBILITY: Soluble in dilute caustic, carbon disulfide, benzene and chloroform.  
HEAT LOSS: 0.5% max.

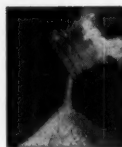
### Zinc dibutyldithiocarbamate

STRUCTURE:



APPEARANCE: Cream-colored powder.  
SPECIFIC GRAVITY: 1.25 at 25° C.  
MELTING POINT: 102° C. min.  
FINENESS: 99.5% thru 200-mesh.  
SOLUBILITY: Soluble in carbon disulfide, benzene, chloroform and gasoline.  
HEAT LOSS: 0.5% max.

**Send for booklet** giving technical data on 30 chemicals that offer possibilities for further research. The coupon is for your convenience.



Dust in dry detergent compound is controlled by the addition of a small amount of Sterox CD.



Sudsing is controlled by Sterox CD, a 100% active detergent, surface-active agent and emulsifier.

## If you don't want dust... if you don't want suds... use Monsanto Sterox CD

Sterox® CD is a liquid, nonionic, 100% active detergent, surface-active agent and emulsifier. It is compatible with cationic and anionic detergents and with soaps. It is efficient in a wide range of applications, including metal cleaning, metal treating, textile scouring and wetting, and in numerous other processes requiring cleaning, wetting out or emulsification.

Sterox CD blends readily with soap, carbonates, silicates, phosphates and all synthetic detergents. It gives outstanding performance in hot or cold, hard or soft water. For technical information, mail the coupon for a free copy of Technical Bulletin No. P-129.

## STEROX CD DATA (typical values)

Appearance	Pale-yellow to light-amber liquid
Odor	Mild fatty odor
Sp. Gr. at 25° C.	1.060
Viscosity	
Saybolt Furol Seconds:	
at 70° F.	250
at 100° F.	100
at 210° F.	20
Pour Point	50° F.
Flash Point	518° F.
Hygroscopicity	Slightly hygroscopic
SOLUBILITY	Miscible in acetone, benzene, carbon tetrachloride, ethanol, xylene. Partly soluble in ether (ethyl), gasoline, kerosene, methanol and mineral spirits.

## URGENT... return containers promptly

There's an acute shortage of tank cars, carboys and drums. These containers are urgently needed for the transportation of chemicals from our plants to yours.

If you buy in tank-car quantities, please unload cars as quickly as possible and start them back to Monsanto.

If you buy in carboys or returnable drums, completely empty one drum or carboy before starting on another, and send the empties back. You'll help yourself to better service by returning drums, carboys and tank cars just as soon as you can. The shipment you hold up may be your own.



## Santomerse No. 1... detergent useful in numerous industries

Versatility makes Monsanto Santomerse® No. 1 the all-purpose detergent and wetting agent. It serves many industries in numerous applications from laying dust on race tracks to dehairing hogs.

Among the various uses of Santomerse No. 1 are cleaning, penetration, dispersion, emulsifying and spreading. It is so effective that many industries that require two or more of these functions use Santomerse No. 1 for all of them. This simplifies their inventories.

Santomerse No. 1 is an anionic detergent-wetting agent with a minimum of 40% active alkyl aryl sulfonate, the remainder being principally sodium sulfate builder. This combination has been found best for high efficiency and economy.

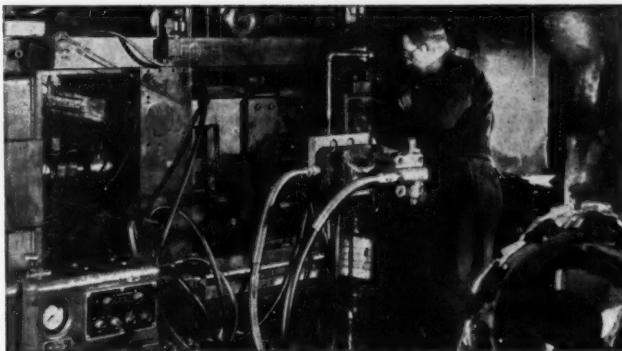
Free-flowing Santomerse No. 1 is compatible with other detergents and builders. It is effective in hard or soft water, in acid or alkaline baths, in hot or cold solutions. In operations where pH is important, Santomerse No. 1 is ideal because it does not affect the pH to any marked degree. Any change that does take place can be adjusted easily.

If you use a detergent or wetting agent in your business, you'll find interesting and helpful information in Monsanto's booklet, "Santomerse No. 1 All-purpose wetting agent and detergent." Indicate your wishes on the coupon and a copy will be mailed to you free. If you want suggestions on the use of Santomerse No. 1 in specific applications, contact the nearest Monsanto Sales Office.

## NEW...Santomerse 80

Santomerse 80 is new in the extensive line of Monsanto's synthetic detergents. It is 80% active alkyl aryl sulfonate, the remainder being principally sodium sulfate builders. Generally, it can be used in place of Santomerse No. 1 to get less bulking. Santomerse 80, available in flakes, blends easily with phosphates, carbonates and silicates. Mail the coupon for details.

## New safety for die casters by maker of Skydrol



Photographed in the plant of the Daimler Corporation.

With Pydraul® F-9, Monsanto brings new safety to die-casting in the same degree that Skydrol® fire-resistant-type hydraulic fluid has brought new safety to aircraft operations. Skydrol now is serving all domestic air lines flying DC-6's.

Pydraul F-9 is a nonflammable-type hydraulic fluid proved under test conditions far more severe than those encountered in normal die-casting operations. For example:

**Pydraul F-9 did not flash or ignite when sprayed, dripped or flooded on molten metal heated to approximately 1,500° F.**

**Pydraul F-9 did not flash or ignite when sprayed, at 1,000 p.s.i., into the 6,000° F. zone of an oxyacetylene welding flame.**

Pydraul F-9 has been proved in service for more than two years. In addition to safety, it offers economy and efficiency. Pydraul F-9 is highly resistant to mechanical shear and chemical breakdown. It is an excellent lubricant that is noncorrosive to metals ordinarily used in hydraulic machines.

If you are interested in a hydraulic fluid that offers extra safety and efficiency, mail the coupon for Monsanto Technical Bulletin No. O-75.

## Orthophenylphenol, Technical, Available

Here's a useful organic chemical that you can buy... now... from Monsanto... at a reasonable price.

It is orthophenylphenol, technical, which is employed as an intermediate or raw material for the manufacture of a variety of products, among them: preservative for glues and paints, germicide for poultry and stock disinfectants.

### Typical Analysis of Orthophenylphenol, Technical

Crystallizing Point.....	50.6° C.
Appearance: Solid.....	Lt. Tan-White
% Ortho P. P. (from Cryst. Pt. Curve).....	95.2
Phenol (from Cryst. Pt. Curve).....	4.8
First Drop.....	277° C.
50%.....	288° C.
Dry Point.....	289° C.

MONSANTO CHEMICAL COMPANY, 1700 South Second Street, St. Louis 4, Missouri. District Sales Offices: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

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SERVING INDUSTRY...WHICH SERVES MANKIND

#### SEND INFORMATION: ☐ Ortho-nitrophenyl.

☐ Orthophenylphenol. ☐ Santomerse 80.

#### SEND LITERATURE: ☐ Intermediates catalog.

☐ Booklet, "Santomerse No. 1."

☐ Sterox CD Bulletin P-129.

☐ Pydraul F-9 Bulletin O-75.

#### SEND SAMPLES:

☐ Zinc diethylthiocarbamate.

☐ Zinc dimethylthiocarbamate.

☐ Zinc dibutylthiocarbamate.

#### MONSANTO CHEMICAL COMPANY

1700 South Second Street, St. Louis 4, Missouri

Please send, without cost or obligation, information, literature or samples indicated at the left.

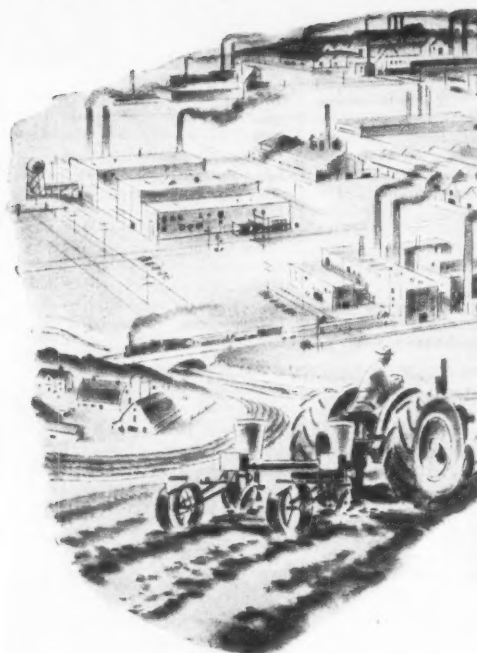
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# OPINION . . . . .

## Being Overlooked?

TO THE EDITOR: With reference to your article "Scramble for Technical Graduates" in June 2 issue, it occurs to me that American industry is overlooking a good source of technical graduates. I refer to foreign students studying in U. S. . . .

At present a substantial number of foreign students are taking technical education in U. S. To employ them, even though temporarily, will not only help the industry which is in dire need of such graduates, but also will help create goodwill in foreign countries.

In general foreign students are allowed at least a period of a year and a half for the purpose of practical training.

D. C. GAMI  
Ann Arbor, Mich.

## Gentisic Factors

TO THE EDITOR: While we welcome any publicity given to gentisates, we feel that the statement as regards its manufacturers appearing in the article entitled, "Salicylate Competition" . . . (June 2nd) should in all justice be corrected. . . .

To the best of our knowledge, Hexagon Laboratories and Fries Bros. (for whom R. W. Greff act as sole selling agents) and this company are the only actual manufacturers of gentisic acid and the sodium salt. . . .

It may also interest your readers to know that ammonium gentisate is available from Chemo Puro for evaluation in such cases where administration of the sodium salt is contraindicated. . . .

P. C. HERELD  
Executive Vice-President  
Chemo Puro Manufacturing Corp.  
Long Island City, N. Y.

CW, in mentioning seven companies as manufacturers or suppliers, said that they "and others" were gentisic factors. We did, unfortunately, overlook Chemo Puro.—ED.

## Tradename Fumble

TO THE EDITOR: The article on page 32 of the June 2, 1951 issue of your magazine is entitled "Packaging . . . Celanese Products in Technicolor Drums." We are calling this to your attention because "Technicolor" is an arbitrary coined word and is the registered trademark and trade name of our company.

Use of the word when referring to our corporation or its products is of course wholly proper. However . . .

when it is used in connection with products other than ours, or in a generic sense, as above, such usage is injurious to our trade rights in the word.

RICHARD E. LYON  
Technicolor Motion Picture Corp.  
Hollywood, Cal.

## Slicker, Cooler

TO THE EDITOR: Regarding your article on "Slicker, Cooler Cutting" . . . (May 19), this represents a more accurate picture of the metal working industry of five or ten years ago than it does today.

It became clear during World War II that "cutting oils", no matter how heavily loaded with fats, sulphur, chlorine or other extreme pressure agents, could not cope with the high speeds (and hence heats) developed in modern machining. . . .

During this period it became increasingly clear that water with its high specific heat and high heat conductivity rather than oil with its relatively poor heat dissipating properties must become the basis for modern cutting fluid.

As stated in your article, classical cutting fluid theory attempts to divide machine tools operations into two categories insofar as cutting fluids are concerned . . . one in which the "cooling" characteristics of the fluid predominates, and the other where its lubrication qualities take preference over "cooling." In the former, the so-called soluble oils are specified . . . in the latter mineral oils with additives.

This approach tends to confirm our inner feelings that water cools . . . while oil lubricates.

Two important misconceptions are involved in this type of thinking. . . . One is the feeling that water is water . . . that all water solutions cool equally well. They don't since they differ considerably in their ability to penetrate and in the volume that reaches the tool point . . . their ability to spread over the tool work area under the high temperature, high pressure conditions found there.

The other is that where lubrication (and here we are talking about boundary lubrication) is involved one must perforce go to oil. Perhaps one of the most difficult concepts for those interested in cutting fluid theory is the realization that properly formulated aqueous cutting fluids . . . are excellent boundary lubricants and compare very favorably . . . with heavily



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Gallon and 5 Gallon  
Containers  
Tank Cars

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Calbrite, FF-L-45

## ESTER GUMS

Glycerol and  
Pentaerythritol  
Types

## PALE WOOD ROSINS

All Grades X to K

## BEREZ

A dark wood resin  
available in solid  
or solution

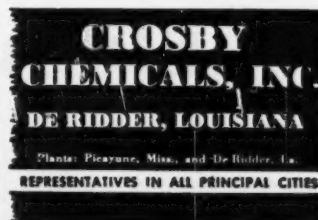
## GLOSS OILS

Gloss Oil 60  
Gloss Oil 65

## MALEIC MODIFIED ESTERS

Crosby 1015, 1016,  
1417, 1418

\*All Pale Rosins and Resins Available in New Type Light Tare, Scrap Value, Aluminum Drums.



# Quality FINE CHEMICALS

## Ammonium Thiosulphate

crystals and 60% solution

### A Few Facts:

Crystalline Ammonium Thiosulphate was first made in this country by the Edwal Laboratories. Ammonium Thiosulphate is available as anhydrous white monoclinic crystals and as a colorless 60% solution of high purity. Both forms are essentially free of heavy metals, sulphate and sulphide. The pH of a 60% solution is above 7.0. It is a mild reducing agent and forms soluble complexes with heavy metals including silver.

### Applications:

**Photography:** working ingredient in high speed fixers . . . saves fixing and washing time.

**Electroplating:** acts as a brightening agent in heavy silver plating baths . . . potentially valuable in other plating.

**Leather, Textile and Other Processing Industries:** reducing agent in chrome tanning, in chrome color textile printing baths, in bleaching and softening wood for fabrication; an effective antichlor; insecticide and fungicide (U. S. Pat. 1,515,308); ingredient of fog screen (U. S. Pat. 1,358,084).

### Technical Service:

Experienced chemists are available to aid with your problems.

### Prompt Delivery:

Delivery made from stock . . . from single drums to carloads . . . crystals packed in 100 lb. fibre drums . . . solution in 50 lb. and 125 lb. carboys and 600 lb. lined drums.

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## OPINION . . . . .

loaded oils. This is true at very low dilutions and without the presence of dermatologically active sulphur, chlorine or phosphorus.

Six years ago this company developed and successfully marketed the chemical cutting fluid concentrate *Lusol* which forms a clear transparent solution (not emulsion) in water. This is widely used . . . is replacing oil in job after job traditionally reserved for oil.

Actually there is no theoretical reason why all cutting operations should not be done outstandingly well in aqueous . . . solutions. The only limitations are those functionally given by the over-all machine tool design and the viscosity of the coolant. . . . Ultimately, and perhaps sooner than we expect, practically all machining will be done in water base solutions.

This development of chemical cutting fluids is economically important to the chemical industry. Tonnage quantities of many new items are required to fill the bill. At the 60 million gallon a year rate mentioned in your article you have a potential market that bears close watching.

A. W. ACKERMAN  
Chief Chemist

F. E. Anderson Oil Co.  
Portland, Conn.

*In discussing cutting fluids CW took on a subject as "hot" as a Democrats vs. Republicans debate. Contrary to Reader Ackerman's opinion, our report was current and up-to-the-minute—based on a survey of the industry we made just three weeks ago. There is, and long has been, two distinct schools of thought on the subject: the all-out proponents of water-based products and those who are oil-base zealots. We reported on the developments in both types of products, think we presented the picture objectively.*  
—ED.

### Emulsifier Report

TO THE EDITOR: . . . I have just read the report on Emulsifiers by J. P. Sanderson and F. K. Abel in your May 26th issue. . . . This is an excellent article. . . .

H. M. CORLEY  
Manager, Chemical Division  
Armour & Co.,  
Chicago, Ill.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 18, N. Y.

## NEWSLETTER

Nowadays a splash in Washington causes ripples throughout the chemical industry. Biggest splash this week was the setting up of a new agricultural chemicals section in NPA's Chemical Division.

Behind this move are squawks, made at House hearings in April and since, that farmers' interests are not being properly looked after by the National Production Authority.

Heading up the new section is Philip H. Groggins, technical adviser to USDA's Bureau of Agricultural and Industrial Chemistry. During World War II he was chief of the chemicals and fertilizers branch of War Food Administration; and his new NPA job will probably be much the same.

But while NPA is gaining one well-known man, it's losing another. Thomas S. Nichols, Mathieson Chemical's president who came to Washington for "a month or two" to straighten out NPA's organizational set-up, has asked to be relieved June 30. He has been there four months and has lately occupied a top spot as Deputy Administrator.

It looks as if NPA and other defense agencies will have plenty to do in the second year of Korean fighting. As the first anniversary of the invasion rolled around this month, military deliveries were triple last year's rate; but the full impact of defense preparations won't be felt until 1952 or the first quarter of 1953.

By then the U. S. will be channeling at least 20% of the national output into defense—almost half of World War II's take. That means more regulation, more allocation, more scrambling for manpower.

And whatever raw materials don't go directly into production will often go into the stockpile—particularly if they're imported from militarily vulnerable areas. Since the first of the year stockpiling has reached over \$1 billion.

But the chemical industry, striving to serve both civilian and military masters, continues to increase its productive capacity:

Basic Refractories, Inc. (Cleveland) is now operating its new \$2¼ million granular magnesia refractory plant at Gabbs, Nev., strategically situated to serve Utah steelmakers and the West Coast.

A petroleum firm—Houston Oil Co.—will make paper in Texas if DPA grants a certificate of necessity. Reason: It owns large tracts of timber land throughout eastern Texas. If plans go through, Scott Paper Co. will be joint contractor and owner of the \$30 million mill.

One way to by-pass the benzene shortage is not to use it. Dow Chemical Co. is building a plant costing over \$10 million to produce methylstyrene (vinyltoluene). This monomer can substitute for styrene in many uses, is made from toluene instead of harder-to-get benzene.

Aluminum Co. of America has let the first contract, a million-cubic-yard earth-moving job, on its \$50 million reduction plant near Wenatchee, Wash. Aluminum production is expected by July, 1952.

Mathieson Chemical Corp. will be ready for expansion when it comes. It has just paid about \$400,000 for 250 acres of land adjoining its Pasadena, Texas, plant. No immediate construction is planned.



Expansion brings up the question of how to pay for it. Victor Chemical Works solved this problem last week by increasing its authorized common stock from 850,000 to 2½ million shares; issuing 150,000 shares of 4% second preferred stock (100,000 shares were immediately sold for \$5 million to a group of institutions); and increasing its borrowings from Equitable Life from \$5 million to \$9 million.

Look for more chemical self-sufficiency in Canada as expansion plans there take shape; you can conversely expect fewer U.S. exports.

Canadian Industries Ltd. may soon make polyethylene—probably in Alberta, where ethylene is readily available.

The same firm plans to manufacture nylon salt, most likely in Eastern Canada. It has been spinning nylon for some time, but with U.S.-made raw material.

Self-sufficiency in acrylonitrile is also foreseen. Canada now uses sizable quantities as a component of acrylonitrile synthetic rubber.

Of paramount concern to specialty makers this week is the raging battle over "fair trade." Price wars are spreading from New York City, their focal point, throughout the country.

They are now awaiting decision on a test case wherein a Queens (N. Y.) druggist has sued to enjoin R. H. Macy from cutting prices on certain national-brand drugs and cosmetics manufactured in New York State. The retailer's lawyer maintains that these intrastate items are not affected by the recent Supreme Court decision—and thus all retailers in the state are obliged to maintain fair-trade prices regardless of whether or not they've signed an agreement to do so.

A countermove has been devised by McKesson & Robbins to protect prices on its drug products: It will require distributors to agree not to resell its products to retailers at less than fair-trade prices in states where fair trade laws are in effect; and it will further require the distributors to negotiate contracts with retailers prohibiting them from reselling to consumers at less than the established minimum price.

Each invoice, thinks McKesson & Robbins, would then constitute a legal contract in fair trade states.

The Texas tax bite (CW Newsletter, June 9) passed the Legislature and will become effective Sept. 1. A natural gas tax of 0.45¢ per 1,000 cu. ft. will add \$12 million a year to the State treasury.

Another \$20½ million will come from seventeen other sources which include such raw materials as crude oil and sulfur.

The Legislature turned down several proposals which would have hit the chemical industry much harder—e.g., a proposed levy on chemical plants' gross receipts.

Significant developments of more than passing interest:

Chemstrand Corp. will build a plant at Pensacola, Fla., to make about 50 million pounds per year of nylon yarn.

R. M. Hollingshead will shortly bring out a new, nonflammable hydraulic fluid. It's also noncorrosive, nontoxic—and cheap.

Manpower shortage note: General Aniline & Film is investing advertising money to persuade parents and teachers to encourage their small charges to plan on chemistry as a career.

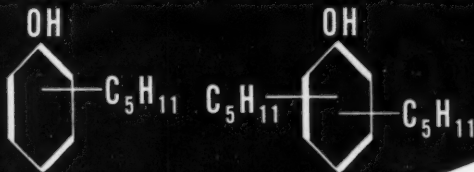
... The Editors

DOUBLE CHECKED

✓  
FROM RESEARCH  
TO INDUSTRY

*Sharples*

# AMYLPHENOLS



Sharples has manufactured amylphenols for over twenty years. Our line consists of both tertiary and secondary isomers.

We shall be glad to furnish technical information relating to any of the following products, although we cannot guarantee delivery of some of these in commercial quantities at present because of defense demands.

**Ortho-sec-Amylphenol**

**Orthophen**  
(Mixed Monoamylphenols)

**Pentaphen**  
(para-tert-Amylphenol)

**Di-tert-amylphenol**

**Di-sec-amylphenol**

Sharples amylphenols are being used by industry as anti-oxidants, as intermediates in resin manufacture, and as raw materials in organic syntheses.

Orthophen is a special blend for use as an antiskinning agent in the paint industry.

*Sharples Chemicals Inc.*

350 FIFTH AVENUE, NEW YORK

80 E. JACKSON BLVD., CHICAGO



25th ANNIVERSARY

# inactivate metallic contaminants by sequestering with Pfizer **Gluconic Acid**

Unwanted traces of iron, aluminum, copper and other metals picked up from pipe lines and processing equipment can be rendered inactive by the use of small amounts of gluconic acid. This non-toxic, non-volatile, non-corrosive acid acts as an effective sequestering agent...makes it all but impossible to detect the metal impurities by common analytical procedures.

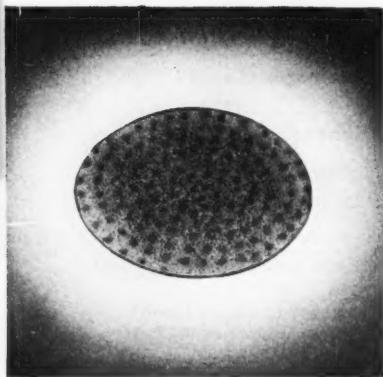
Gluconic acid prevents the precipitation of metallic cations at pH values ranging from 4.5 to relatively high caustic solutions. In the case of calcium and magnesium it has been proven particularly effective as a sequestering agent in relatively strong—3%—caustic concentrations.

One of the mildest acids available, gluconic acid is used as a sequestering agent in many processes including textile printing, industrial water treatment and tanning, and in detergent formulations. It is marketed as an amber, 50% aqueous solution possessing a slight acetous odor, and has a specific gravity of 1.24 at 25°C.

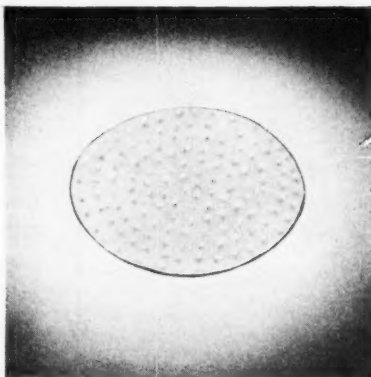
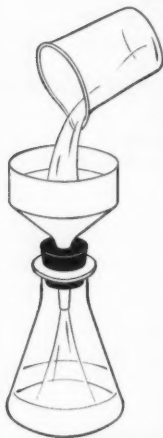
Write our Technical Service Department today for complete information, samples and prices.



## PFIZER



Without Gluconic Acid



With Gluconic Acid

A small amount of gluconic acid was added to one of two beakers containing an iron solution. Both solutions were made alkaline by the addition of caustic soda. In the case of the solution without the gluconic acid, a precipitate of ferric hydroxide was formed. The solution with the gluconic acid remained clear even though adjusted to the same alkalinity.

# GLUCONIC ACID

AMMONIUM GLUCONATE • CALCIUM GLUCONATE • COPPER GLUCONATE • FERROUS GLUCONATE • MAGNESIUM GLUCONATE  
MANGANESE GLUCONATE • POTASSIUM GLUCONATE • SODIUM GLUCONATE  
CHAS. PFIZER & CO., INC., 630 FLUSHING AVE., BROOKLYN 6, N. Y.; 425 NORTH MICHIGAN AVE., CHICAGO 11, ILL.; 605 THIRD ST., SAN FRANCISCO 7, CALIF.

## BUSINESS & INDUSTRY . . . . .



MERCK, MUNSON AND WARD: Within a restricted framework, lots of room for broadening.

### MCA Keeps Pace with Industry's Growth

Emerging dominance of the chemical industry has created wider opportunities for the Manufacturing Chemists' Association.

Confined largely to technical matters during its first 78 years, MCA has embarked during the past year on a program of public relations—to broadcast facts and dispel fallacies.

As MCA embarks on its 80th year, it foresees further emphasis on the spokesman's role which destiny has forced upon it.

As members of MCA met this week at restful, relaxing White Sulphur Springs, W. Va., they found that their Association was far less restful and relaxed than at any time in its 79-year history.

The fourth paragraph of their Board of Directors' annual report sounded the keynote of a new, vigorous MCA: "Events during the past 12 months have demonstrated that the Association cannot limit its activities to matters of purely technical nature . . ." And further on: ". . . our Association has become the spokesman for the industry . . ."

**Full Circle:** In defining its functions in these broad terms, MCA is actually returning to the role for which it was founded. Late in 1871 the 42nd Congress announced a tariff revision pro-

gram, and MCA was hastily organized (with the Sulphuric Acid Manufacturers Association, organized in 1869, as a nucleus) to present a united front of opposition to duty cuts. In 1881 it acted in concert with other industries, again to protest lowered protection, and in 1900 it opposed a reciprocal trade treaty with France with the familiar argument that cheapness of French labor would depress American wage standards.

MCA has continued to this day its fight for tariff protection of the U. S. chemical industry, presenting briefs upon request\* before various Congressional hearings.

But that function has been largely overshadowed by MCA's emphasis on

technical matters—pollution abatement, safe handling of chemicals, labeling, packaging, shipping, etc.—of general concern to the industry. This phase of the Association's activities is carried out by technical committees, composed of member firms' representatives who work without remuneration from MCA.

**Committees Are Bulwark:** These committees are the bulwark of the Association; and their quiet, efficient work has led to the general adoption of safer containers, precautionary labels, approved handling practices, and other safety and welfare measures.

The Association's directors and officers (except those who work full time for MCA) also serve without pay. Many of them have served for years

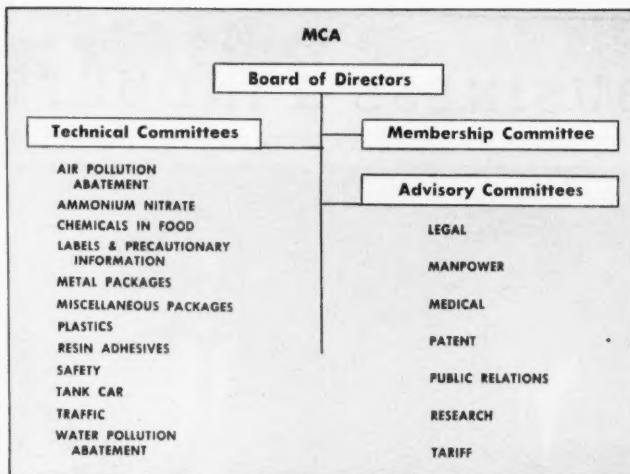
\* MCA is not registered as a lobbyist.

in various capacities. Slated to occupy the chief positions during the coming year are Charles S. Munson (Air Reduction Co.), board chairman; W. H. Ward (Du Pont Co.), vice chairman; George W. Merck (Merck & Co.), president; and J. W. McLaughlin (Bakelite Co.), treasurer.

**Washington:** Most of the full-time MCA personnel work at the Washington headquarters. There they guide members through the Washington maze; gather industry statistics; prepare reports to the members on state and Federal legislation, government publications, administrative rulings, labor news, business conditions, and other pertinent developments on the Capitol scene.

The Washington office also furnishes clerical help and other assistance to the technical committees, which are currently working on such diverse problems as coatings for fiber drums to make them suitable for liquids; safety problems in shipping monomers; lining materials for tank cars and trucks; suitable alloys for drums to carry mixed acids; and mileage allowance on tank cars.

**New York:** Signaling the Association's awakened interest in public relations was the opening last fall of a New York office headed up by Robert L. Taylor, executive vice-president. His job is to keep in touch with the various committees to keep abreast of what they're doing, and publicizing their activities through his contacts with newspapers, magazines, radio and television, and the technical press. He is also building an informa-



MCA SET-UP: Technical committees are the keystone.

tion file on the chemical industry, eventually hopes to serve the nation's communications media as the recognized fount of factual data on the industry.

The current public relations program is modest. But the pressure of misinformed and often misled public opinion, the zeal for free trade, government attempts to put undue burdens on operations, all call for a vigorous campaign on the part of the industry to tell its story—which one editor close to the industry has called “the greatest story never told.”

In the light of these circumstances it is likely that MCA will shift its emphasis from purely technical affairs to general problems of a more controversial nature—problems that require the enlistment of support from wide segments of industry, government, and even the general public.

That kind of program costs money. Back in 1924 membership dues were \$75 a year, regardless of size. Today the minimum is \$300 for the smallest firms, and a graduated fee based on payroll puts annual fees for the larger firms over \$10,000.

Higher dues is one way to finance a broader program of activities. But another way—which MCA will pursue actively this year—is to increase membership. It now represents about 90% of the nation's chemical output, but only about two-thirds of the individual firms. Non-members are obviously concentrated among the smaller establishments.

**Not Unanimous:** Also, the chemical

industry, in its various organizations, mirrors the manifold sects of religion, and largely for the same reason: basic differences of opinion. The “ecumenical” movement in the industry resulted last year in the merger of the Plastic Materials Manufacturers Association into MCA, but a proposal to consolidate with the Synthetic Organic Chemical Manufacturers Association founded on the rocks of a disparate philosophy: SOCMA thought that MCA was not active enough in wielding a lance for the industry in the legislative arena. Some MCA members, on the other hand, think their Association is going too far.

It's easy enough to get chemical firms of different sizes and shapes to agree on the proper handling of benzene or trichlorethylene, but it's a different matter to find a common basis of action on controversial issues. Small firms and large firms, alkali makers and drug manufacturers may be on opposite sides of the fence—and an organization that tries faithfully to serve all will often find itself ear-deep in hot water.

Thus MCA must apply three criteria to every action it considers: Will it benefit the whole industry? Can it be done better cooperatively than individually? Is it legal?

Even within the restricted framework of three yeses, there's lots of room for broadening of MCA's service to industry; and the mood at White Sulphur Springs this week points surely and directly in that direction.



J. W. McLAUGHLIN: The treasury will get fatter.





**BUG-WATCHERS' GUIDE:** Cotton insect handbook in three languages has vital role in Hercules' toxaphene program.

## Discretion: Better Part of Sales

It isn't often that a company voluntarily backs out of a lush and growing market for one of its products. But this week Hercules Powder Co. did just that. In a letter to principal customers for toxaphene, the company's prime insecticide, Hercules withdrew recommendations for use of the product on bright leaf tobacco crops . . . pending further research. Reason: Current investigations (some sponsored by Hercules) indicate that toxaphene might have a slight effect on the smoking flavor of tobacco.

Just how many customers who formulate toxaphene insecticide mixtures for tobacco went home and cried, will never be known. But some of the tears should be shed for Hercules. Last year, over 2 million pounds of toxaphene (67-69% chlorinated camphene) was used to fight the insects that plague tobacco.

The move came as no surprise, however, to persons who had watched the cautious and constructive sales development program that Hercules has used to extend the use of toxaphene. Right from the outset in 1947, when toxaphene was launched on the commercial insecticide market, the main emphasis has been more to develop than "promote" the sales potential of the product.

**Right Use:** In an interview with *CHEMICAL WEEK*, Paul Mayfield, assistant general manager of the naval stores department of Hercules, re-

vealed some of the thinking behind the toxaphene program. Said Mayfield: "We knew almost from the start that we had a sound product in toxaphene . . . the big problem was to make sure that it would be used sensibly, in the right form and for the right purpose. Not to take these precautions would have been bad business."

The "good business" approach has paid off well. In the short space of four selling years, toxaphene has become a leading agricultural insecticide. Over 80% of the material is used to fight cotton insects against which it has proved to be unusually effective. It is also being employed, in increasing quantities, against armyworms, cutworms, alfalfa insects, and many other crop vandals.

**Vigil Pays:** Constant vigilance is maintained by Hercules to insure that insecticide formulators do right by toxaphene. Hercules men make a systematic check of field samples to ascertain whether suitable products are being offered the grower. When an improper mixture is spotted, the erring formulator is advised . . . for the benefit of all concerned.

**Safety Too:** Even the safety conditions in formulators' plants come under the scope of the Hercules program. Since toxaphene is poisonous to humans (and other warm-blooded animals), Hercules men advise customers on handling toxaphene and preparing toxaphene insecticides.

**Education:** Education of the farmer in insecticide usage plays an important part in the toxaphene program. Over 2 million copies of an illustrated handbook describing the looks and eating habits of cotton insects have been distributed to farmers. Almost 200,000 of these books have been printed in Spanish and Portuguese for the benefit of Mexican, Central American and South American cotton growers. Note: The word "toxaphene" appears only once in the copy of the American and Mexican editions.

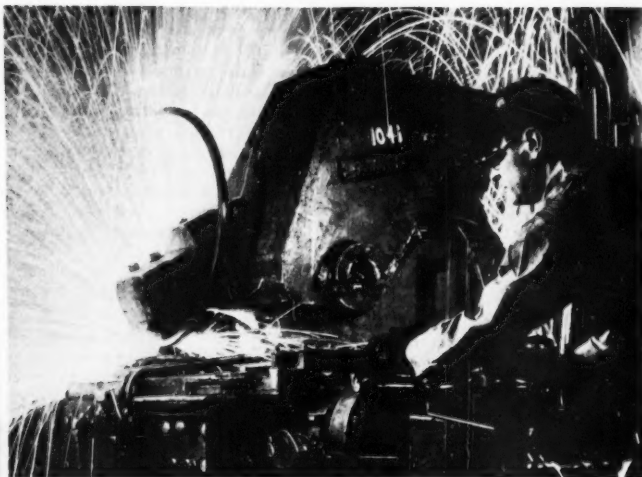
Another important part of the program is the "Toxaphene News Digest" which is published periodically by Hercules. It reports the latest news on the constant war against insects and has a wide circulation in agricultural circles.

Extensive magazine and newspaper campaigns are maintained in the cotton-growing areas to advance the proper application of toxaphene-containing insecticides. In addition, 30 radio stations in these districts beam a steady stream of information to the farmer re insecticides in general. But Hercules is always careful never to advocate the commercial use of toxaphene within a state until the agricultural agency of that state first makes its own recommendation.

**Home At Last:** Delaware was one of the first states to give the official nod to toxaphene. But only this week did Wilmington citizens have their first need for the product as they armed to fight an invasion by armyworms and spittlebugs. And they bought their toxaphene in a store just two blocks from the Hercules' home office.



**MAYFIELD:** "Taking precautions is good business."



TITANIUM RINGS FOR JET ENGINES: Another demand that augurs . . .

## More Tonnage for Titanium

Crane's move in titanium has industry guessing. Its ton-a-week goal will rival the 1950 production (60 tons) of . .

Du Pont and National Lead. But they will turn out 500 tons this year, will hit a rate of 5,000 tons by end of 1952.

Expanded use and plentiful raw material portend big future for titanium, but cheaper process is necessary.

Crane Co.'s plunge into the metallic titanium field (CW, June 2) is arousing a great deal of interest—both among prospective users and present producers. In general, industry is advancing two reasons for the company's surprising decision: First, it may be the result of a natural desire by a prosperous firm to diversify activities. Second, and more significant, is the guess that eventually titanium may play an important role in Crane valves.

In any event, the consensus is that the Chicago firm is in the titanium business for keeps. Furthermore, its entry with a pilot-plant production goal of a ton a week points up the commercial stature which titanium has attained.

A few years ago, production on that scale would have been dismissed as ambitious daydreaming. Even last year it would have approached the combined efforts of the Big Two (Du Pont and National Lead). This year, however, Crane's initial contributions will amount to a drop in the over-all bucket. The industry has raised its sights, is shooting for a 500-ton pro-

duction in 1951, expects to be turning the metal out at an annual rate of 5,000 tons by the end of 1952 or shortly thereafter.

**Big Two:** One of the pioneers in the field, Du Pont has a completely integrated operation. Titanium dioxide from its Florida deposits is chlorinated to the tetrachloride, which is reduced to titanium "sponge." Principal markets for the sponge are Remcru (owned by Du Pont and Crucible Steel), Republic Steel, P. R. Mallory, and International Nickel. Du Pont's new plant at Newport will push the company's sponge production to about 14 tons per day.

By virtue of its joint ownership (with Allegheny Ludlum) of Titanium Metals Corp., its Titanium Alloys Division, and its large holdings of rutile and ilmenite deposits, National Lead is the other member of the Big Two.

It starts with Stauffer Chemical's titanium tetrachloride, (which Stauffer makes from National Lead's titanium cyanonitride), reduces it to sponge, and melts the sponge to ingots. In addition, the company pro-

duces some tetrachloride for its own use. Present plans call for a \$14 million plant in Henderson, Nev., which will "substantially" boost titanium output.

Crane will also start its operations with Stauffer's tetrachloride. However, since production economies argue for integration from mining to sponge, it is unlikely that Stauffer will continue to play an important role in the titanium picture. Furthermore, Stauffer's present facilities are limited, and it has expressed neither the intention nor the desire to expand them.

Metal Hydrides (Beverly, Mass.) is the only other tonnage producer of the metal. It turns out a powdered form—analyzing 98.5% titanium—for experimental use. Formerly the Bureau of Mines produced the powdered metal, but now Metal Hydrides is the sole source, producing it at a rate of 1,500 lbs. per week.

New Jersey Zinc, because of its venture (with Kennecott Copper) in exploiting the huge ilmenite reserves in the Lac Tio (Quebec) area, has often been mentioned as a dark horse in the production of metallic titanium. But the stated purpose of the Canadian enterprise is to produce pig iron, with titania as a by-product. At this point, any further assumption is unwarranted.

**Processes:** Crane says it will use a modification of the Kroll process for separating the metal from its ore. (The Kroll process presently seems to be the most suitable for tonnage production.) As adapted by the Bureau of Mines for commercial production, it consists of reducing the tetrachloride with magnesium. Most of the excess magnesium and magnesium chloride is tapped off in liquid form; the remainder is either distilled off under vacuum or leached out with dilute hydrochloric acid. Yields run over 90% but the method is batchwise and cumbersome, results in the high (\$5 a lb.) price tag on the sponge.

The classical method for producing titanium metal involves the decomposition of titanium iodides on a hot filament. It produces a product of relatively high purity, but is too expensive for practical commercial use.

Melting the sponge to ingot presents another problem. One reason is titanium's affinity for absorbing gases and the fact that trace amounts of impurities drastically alter properties. Another difficulty is that molten titanium combines with practically every known refractory. Allegheny Ludlum arc-melts in a water-cooled copper crucible under an inert blanket. Du Pont uses induction melting in a

graphite crucible in the presence of argon.

**Properties:** The commercial unveiling of titanium brought rave notices, led to it being hailed as a Wonder Metal. Later analyses swung opinion in the other direction. As usual, the truth lies somewhere between the two extremes, although leaning more toward the original appraisal.

It is light in weight (heavier than aluminum, lighter than steel), extremely strong, and possesses excellent ductility. But, in spite of its high melting point (3,160 F), it loses strength and becomes brittle on continued exposure to temperatures above 1,000 F.

One of its most attractive properties is its resistance to corrosion. Its immunity to salt water has excited interest on the part of the Navy and shipbuilders—there has been talk of all-titanium battleships. Its light weight and strength has caused the Army Ordnance to think in terms of weapons that can be easily transported by air. And the AEC which uses liquid metals in various reactor systems is interested in titanium. It is exploring the possibilities of its use as a container vessel for several molten metals.

One difficulty in evaluating the properties of titanium is that present batch processes result in a product that varies slightly in composition. Since even a small variation markedly affects properties, laboratory tests on one sample aren't conclusive. The best criterion is actual service tests. For instance Titanium Metals reports laboratory results showed titanium highly susceptible to sulfuric acid. But service tests by a large chemical company proved it far superior to stainless steel for acid concentrations as high as 22% at elevated temperature and pressure. As a result, the company is constructing a large operational unit made entirely of titanium. Another production unit under construction involves ferrous chloride, and a large pharmaceutical concern is using titanium tubing for process equipment.

**Outlook:** The future of titanium lies in its alloys. In fact, the present grade being sold as "commercially pure titanium" is itself an alloy containing 99.5% titanium. Crane Co. intends to explore alloying potentials of chromium, magnesium, and aluminum. This is in line with work done by early researchers who indicated them as prime possibilities. Molybdenum is also considered a good bet.

There is no lack of titanium—it's the fourth most abundant metal in the

earth's crust. And there is certainly sufficient demand for it. The present problem is to reduce production costs to make the material more widely available.

No doubt there will be plenty of buyers for the proposed 5,000 tons a year. But a continuous process, or an electrolytic one, is a must if titanium is to gain a foothold as an important structural material.

## Coat for Maggy

Today the applications for magnesium metal and alloys have been greatly increased by the discovery of a new adherent electrolytic coating technique. Panels coated by the new process show no corrosion in up to 90 hours' contact with salt spray.

A new coating to increase the corrosion resistance of magnesium and its alloys has been discovered by electrochemist H. A. Evangelides at the Army Ordnance Corps' Frankford Arsenal. The new coating, dubbed HAE in honor of its inventor, was discovered as a by-product of work to determine performance limits of magnesium coatings for Ordnance applications.

It is applied in much the same manner as aluminum is coated during the anodizing process. The metallic item is made the anode in a dichromate solution and a current passed through the electrolyte. The coating formed by this operation and a subsequent hydrofluoric acid dip is normally brown in color, provides a good paint base.

**Temperature-Resistant:** The bond

between the coating and the metal is strongly adherent. It is not loosened by heating to 1,100 F and quenching in cold water. Also it is possible to heat a panel of HAE-coated magnesium to 2,500 F without rupture. The magnesium will melt, but the coating is so adherent that, at worst, a bulge will form.

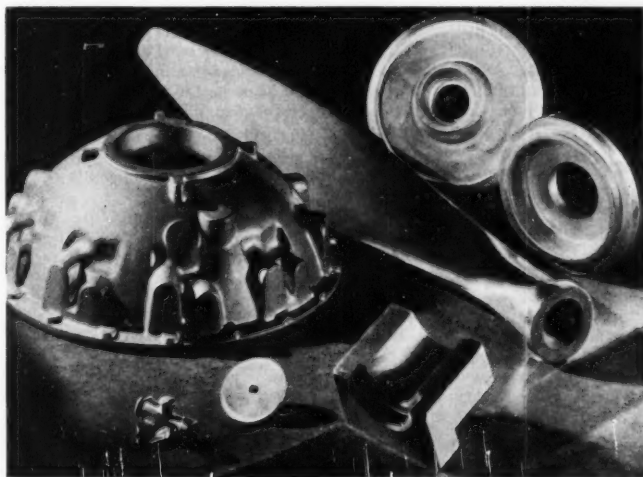
Highly resistant to galvanic corrosion, HAE will scratch glass. Also specimens lose very little tensile strength in the anodizing operation. Major potential fields, where the susceptibility of magnesium to corrosion has limited its use: in marine applications, high-temperature work where time-at-temperature is relatively short, where extreme hardness and abrasion resistance is required, and in other applications where chemical inertness is a must.

## It's Not Oil

Natural gas is not petroleum, and rights reserved for the latter on land in Alberta, Canada, do not include the former.

That's the ruling handed down by Chief Justice W. R. Howson, of the Alberta Supreme Court trial division, in a suit brought by farmer Michael Borys against the Canadian Pacific Railway Co. and Imperial Oil Co. Canadian Pacific sold the land to Borys' father in 1906, but reserved petroleum rights; Imperial leased these rights from CPR.

Imperial was about to drill on Borys' land when he applied for an



FABRICATED MAGNESIUM: A brownish coat checks corrosion.

injunction, granted March 1, 1950.

Defendants CPR and Imperial contended that by reserving petroleum rights, natural gas also had been reserved. But Chief Justice Howson ruled that the two are entirely different products, and that exhibits entered at the trial proved that CPR used "apt and indeed express language" when they wished to reserve or except natural gas in other instances. Moreover, CPR did not specify natural gas in any of its reservations until 1911, roughly when commercial use of natural gas began in Alberta.

**Hands Off:** The chief justice imposed a permanent injunction restraining CPR and Imperial Oil from "using, removing, wasting, or interfering with or otherwise disposing of" natural gas on Borys' land.

His judgment said in part: "My conclusion is, and I find as a fact, that there is a valid reservation of petroleum, i.e. mineral oil, within, upon or under the said lands, but there is no reservation of natural gas, whether wet or dry, or held in solution with the mineral oil and the same is the property of the plaintiff (Borys).

The defendants have no right to possess and enjoy the petroleum at the expense of the plaintiff and by using, without the plaintiff's agreement, the plaintiff's natural gas."

In effect, therefore, CPR and Imperial Oil will have to pay Borys, and any other farmer with similar pioneer land holdings, for natural gas taken from the land in the process of oil production, as well as straight gas production. Full import of this judgment is not yet definitely known. An Alberta government source says 5,000 farmers, holding 2 million acres in the province, might benefit if the ruling is upheld. However, not all are located in gas and oil areas. Assistant deputy minister of mines and minerals, H. H. Somerville, believes the ruling will not have wide bearing since the Alberta government holds title to 90% of gas and petroleum rights outside Dominion parks within the province.

**The Difference:** Chief Justice Howson, in the portion of his judgment on differentiation of the words "petroleum" and "natural gas" said: "In the vernacular of the mining world, the commercial world and land owners, or in the popular sense, or in the language of 'plain men,' it has been proved: that petroleum does not include natural gas, but is the equivalent of crude oil; that natural gas is regarded as a distinct and different product from petroleum."

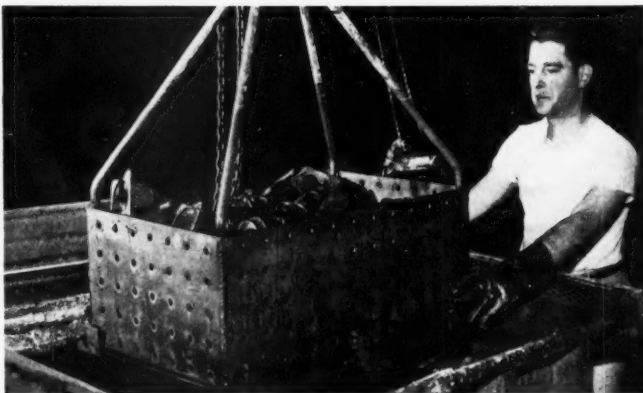
According to Howson, any other

interpretation is entirely opposed to the spirit of the system of reservations and proprietorship of land in Alberta, the leasing of petroleum and natural gas rights in the province, treatment of the two substances by dominion and provincial legislation, and the literature of the country.

The Canadian Year Book long had treated the two as separate minerals, and in no instance did standard or technical and scientific dictionaries define petroleum to include natural gas, as suggested by the defendants' witnesses.

"The term 'petroleum' is not a technical or scientific term. It is an ordinary English word having a wide general usage. The agreement of 1906 and the transfer of 1918 were documents between ordinary people using ordinary language.

It is manifest that Simon Borys (a Ukrainian immigrant) did not understand petroleum in any wider sense than oil. He could neither read nor write the English language. There are no Ukrainian words for petroleum and the nearest Ukrainian word is the word 'olivha' which means 'oil.'"

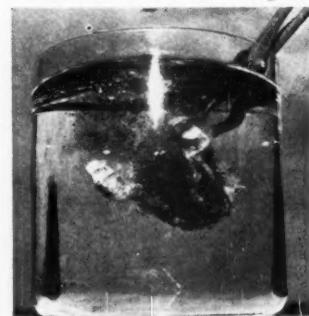


**BASKET OF FORGINGS** is withdrawn from SR-4 bath after 5-minute immersion. Forgings are then heat treated and quenched.

## Chemical "Blast" Removes Scale

A familiar and necessary adjunct to every drop forging plant is a noisy, dusty, time-consuming sand- or shot-blasting unit to remove tenacious oxide scale. Now a chemical formulation, which reacts with the steel and scale in the heat-treating furnace to make the scale less adherent, cuts descaling costs up to 90%.

Pennsylvania Salt Manufacturing Co.



**TRIAL IN BEAKER** shows how scale pops off hot forgings upon quenching.

is marketing a pre-heat chemical bath which completely removes this scale during quenching.

The bath is made up of a new product, Pennsalt SR-4, dissolved in weak muriatic acid and water. The product was developed from a practice originated at the Toledo, Ohio, and Pottstown, Pa., plants of the Spicer Manufacturing Division of the Dana Corp. Pennsalt and Spicer researchers cooperated in the development and in laboratory and plant tests. The new product has been adopted by Spicer in several of its production operations.

The Pennsalt SR-4 bath requires no heating and is made up in ordinary rubber lined tanks. Dipping baskets can be made of simple sheet iron.

Parts covered with forging scale are immersed in the bath for five minutes and then may be placed directly into heat treating furnaces or can be stored for later heat treating.

The forgings are heat treated at a temperature range from 1,500 to 1,600 F and soaked at temperature for the minimum time consistent with good



metallurgical practice. An additional saving results from the fact that the forgings can be heat treated in a non-reducing atmosphere or without a prepared atmosphere.

Following the heating the forgings are water quenched and tempered. In conventional operations, the tenacious furnace scale is then removed by expensive sand-or shot-blasting, but with the use of the SR-4 bath, this process is completely eliminated in most operations. When the forgings treated with SR-4 are water quenched, the scale actually blasts off from all surfaces, leaving them perfectly clean for subsequent machining.

## Scrub Oak Pulp

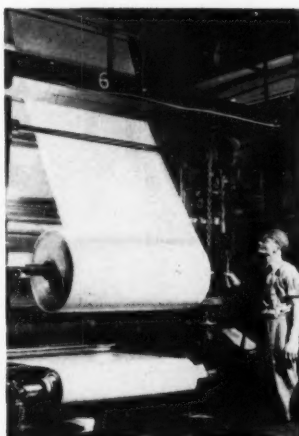
This week, the Georgia State Legislature is considering a recommendation to appropriate funds for a joint program with the University of Florida. Object of study: possibility of commercially exploiting a University of Florida process for using scrub oak as a filler in the production of high grade paper.

The principal objection to the use of scrub oak in any sort of pulp manufacturing has been the difficulty in removing the bark; it is completely immune to ordinary barking procedures. University of Florida researchers solved the problem by chipping the log without debarking.

During the process, the shattering action of the knives removes the bark from the wood. The components are then separated by passing the mixture over an air flotation table (which separates them by taking advantage of the difference in gravity and particle size). Wood chips are discharged at one end of the table, the bark at the other. In the middle a mixture of bark and wood collects and is sent back to the feed hopper for recycling.

At present, University scientists are using the process to make 2 quarts of pulp at a time in a small cooker. Limited funds for scrub oak research have hindered further development, led to the calling on Georgia for financial assistance.

Last week, a group of state legislators made the trip from Atlanta to Gainesville to witness the process in operation. At least two of them came home convinced of its potentialities, and immediately put forth the suggestion before the legislature that Georgia supply the necessary funds. Under the terms of the proposal, Georgia would supply the money, the University of Florida would turn the process over to Herty Laboratories. Herty



PAPER: From little oaks, profits.

would then try to work the process up to full-scale production.

The pulp and paper has not been sitting idly by while the work has been going on. At one time or another several big companies have been reported interested in the process. Putting to use the millions of useless acres of scrub oak (in Florida alone it has been estimated that there are 5,000 sq. mi.) presents undeniable attractions. But there are several commercial barriers. One big objection is that the scrub oak would be difficult and expensive to gather. The barriers are not insurmountable, however, and industry's present attitude is one of "watchful waiting."

## EXPANSION . . . . .

**Cabot:** Prospects of a new multi-million-dollar chemical plant in the Lake Pontchartrain area of New Orleans got a boost this week with the sale of a three-quarter interest in four shut-in gas-condensate wells to Cabot Carbon (Boston) for \$2 million. The interest was purchased from Lynn Oil and Temple Hargrove, an independent producer; the remaining quarter interest is retained by Atlantic Refining. Based on discoveries to date, estimates have placed gas reserves in the field between 35 and 50 billion cu. ft. Cabot officials will make a survey of the plant site preparatory to making further plans.

**Chemstrand:** Signing of a license last week completed formal arrangements for production of Du Pont nylon. Financial arrangements had been made (CIW, Apr. 21), and certificates of

necessity have been granted for plants to make nylon and Chemstrand's acrylic fiber. On signing the license, Chemstrand president Osborne Bezanon stated production of the acrylic fiber will hit 30 million lbs.

**Du Pont:** A new \$12-million office building is now under construction, will be completed by fall of this year. Located near Milford Crossroads, two miles south of Newark, Del., the building will provide office space for about 2,000 people. Reason for building outside of Wilmington: to avoid traffic jams which the office building would entail.

**Buffalo Electro-Chemical:** A steadily increasing demand for potassium persulfate and hydrogen peroxide has prompted the company to erect a \$1,450,000 addition to its Tonawanda plant. Despite record production, Buffalo Electro-Chemical is now allocating products to its customers. New facilities will "materially" boost production.

## KEY CHANGES . .

**Bruno Puetzer:** To vice president, research, Schenley Laboratories.

**James H. Noyes:** To vice president, production, Schenley Laboratories.

**Samuel Miller:** To vice president, development, Schenley Laboratories.

**Herbert H. Clarke, Jr.:** From manager, West Coast activities, to vice president, Borden Co's Chemical Division.

**Charles W. Niederauer:** From manager of general services and executive assistant to the president, to vice president, Borden Co's Chemical Division.

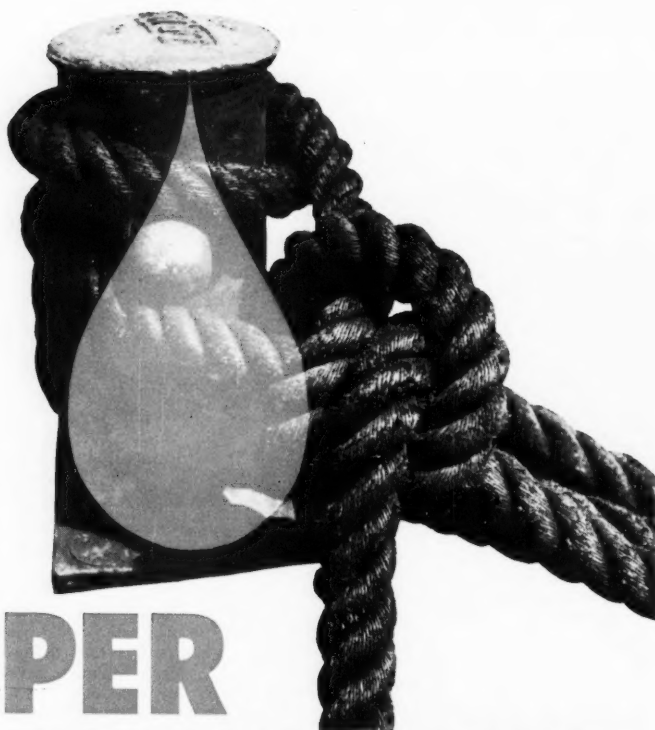
**Paul O. Powers:** From technical advisor to Battelle Memorial Institute, to chemical director, Pennsylvania Industrial Chem. Corp.

**Howard Berry:** From vice president, treasurer, and director, Mathieson Chemical Corp. to senior associate, R. S. Aries & Associates.

**Frank O. Prior:** From vice president in charge of production, to executive vice president, Standard Oil Co. (Ind.).

**Donald H. Wheeler:** From director of technical sales and service, to research laboratories, General Mills Chemical Division.





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You'll want to put ADVANCE Copper Naphthenates to work for you to eliminate extensive damages to braided cordage, cotton canvas and wood surfaces. ADVANCE produces these chemical compounds of metallic copper and naphthenic acids to meet all needs. And, as a special service, develops these fungicidal agents for special impregnations. Through the improvement and adaptation of Copper and Zinc Naphthenates to new needs, ADVANCE helps increase the value of materials so important to industry and defense.

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*Our technical service staff will be glad to help you solve any problem.*

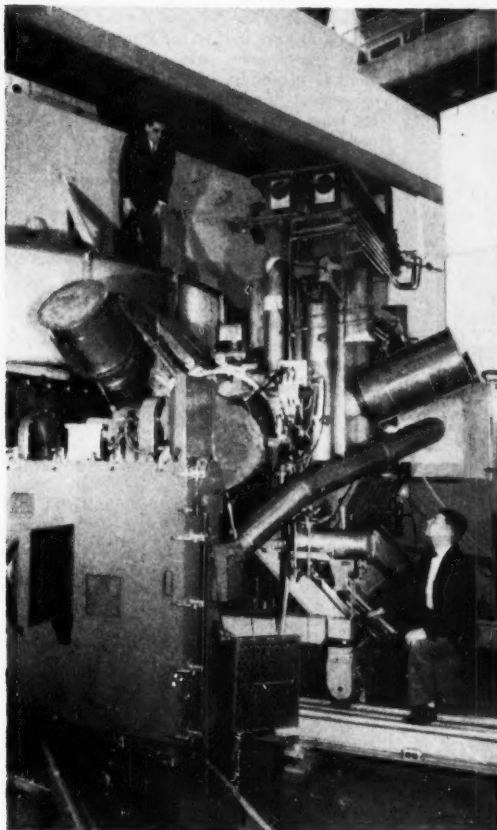


**ADVANCE SOLVENTS & CHEMICAL CORP.**

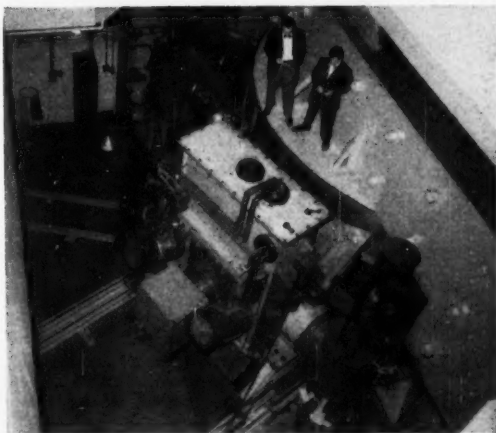
**245 FIFTH AVENUE, NEW YORK 16, N. Y.**

PHOTOS: STANDARD OIL CO. (N. J.)

# RESEARCH . . . . .



**SYNCHROTRON'S SIZE** is highlighted by comparison with Institutes' researchers.



**HUGE CONCRETE PIT** surrounds giant addition to nation's largest private nuclear research program.



**PHYSICIST ENRICO FERMI** at controls. He will use accelerator to study newly discovered mesons.

## Next: A Billion Electron Volts

University of Chicago's new 450-million electron volt (Mev.) synchro-cyclotron is the nuclear physicist's latest step in his climb to a billion electron volts (Bev). Built in 3½ years at a cost of \$2.5 million, the giant proton accelerator will be an invaluable aid to basic research in nuclear physics, metallurgy, radiobiology, and biophysics, now in progress at the University's Research Institutes.

Today the most powerful atom smasher in known existence, Chicago's synchrotron may soon be overshadowed by the University of California's billion electron volt beva-tron.\* But this in no way detracts

from the true significance of the synchrotron as the key to the charmed upper-energy range. Unlike conventional cyclotrons—which cannot get over 30 Mev—the synchrotron has no theoretical energy limit; 450 Mev is a figure dictated by space and financial considerations. Berkeley's beva-tron is nothing more than a synchrotron with modifications designed to minimize these practical limitations.

Housed in a special Accelerator Building at the University of Chicago's Institutes, the new machine will be at the disposal of such eminent scientists as Harold Urey, Enrico Fermi, James Franck, and others. The synchrotron will see a good deal of

service in investigations aimed at the development of a true science of metallurgy to fill the needs of atomic energy, jet aviation, and the process industries. Other fields of study: effects of radiation on living tissue; nuclear binding forces; cosmic rays; radiation in the treatment of disease.

Office of Naval Research picked up the best part of the tab for the high-powered accelerator. Recent unveiling of the synchrotron highlighted the dedication of \$5 million worth of new facilities at the Institutes.

Established six years ago—three days after A-bombing of Hiroshima—the Institutes now represent the largest private nuclear research program in U.S.

\* Now under construction at Berkeley, Cal.



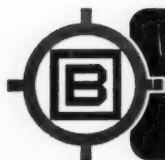
## Is Paraffin DOING THE JOB?

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5. Increased Mar Resistance
6. Reduced Blocking

Of course, we are not suggesting that one microcrystalline wax will solve all these problems, however, from the 19 different grades manufactured by Bareco, the correct one can be chosen to gain any one of the above desired properties.

Write for free Bareco Microcrystalline Wax samples and specifications today. Test these samples in your own laboratories and determine to your personal satisfaction how these quality waxes can modify or replace your paraffin application for increased effectiveness. Also, new Bareco pamphlet series, "The Wax Story" will be furnished free of charge upon your request.



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## RESEARCH . . . . .

### Solid Spectrometry

Researchers at the National Bureau of Standards have pushed the frontier of mass spectrometry into quantitative analysis of solids. Faster and more convenient than chemical methods, the mass spectrometer will be a vital tool, in the development of new alloys, ore analysis, and research on semiconductors. In process control, the advance should contribute to more economical manufacture of steel and other metals.

Rapid analysis of complex gas mixtures, made easy by the mass spectrometer, has long teased researchers with the possibility of applying the instrument to solids. But conventional techniques unfortunately could never be successfully adapted to solid analysis.



**MASS SPECTROMETER:** Solid analysis at the current peak.

Ionization is essential to spectrometric analysis. A vacuum spark is the best way to get ions from solid materials, but great variation in intensity of the resulting ion beam has heretofore ruled out electrical methods of detection. Photographic detection, used instead, is laden with pitfalls, inherently limited in accuracy, convenience, speed, and applicability. Consequently, the mass spectrometer has been out of its medium in the solid phase.

**Keeps the Spark:** The new NBS technique gets around these objections. Developed by the Bureau's J. C. Gorman, J. A. Hipple, and E. J. Jones, it retains the vacuum spark, also uses electrical detection by minimizing the effect of variation in ion

beam intensity. Ions are obtained from a spark between a rod of the sample material and a tantalum disc. A monitoring collector placed in the path of the ion beam measures total ions.

Next, the ions are separated according to mass in a modified Dempster-type mass spectrophotometer. After separation, currents produced by ions of different masses are measured and a pen-and-ink apparatus records the ratio of each ion current to the total ion current (measured by the monitor). Since the total and partial currents tend to undergo the same fluctuations, the recorder ratio will be constant for ions of one type as long as their concentration in the sample does not change.

From the measured value of the spectrophotometer magnetic field and other constants of the apparatus, the mass number of each ion is found. This mass number, plotted against ion current ratio, gives a sharp peak. In general, the ion current peak represents the most abundant isotope and therefore accounts for only a part of the element in the sample. A value that includes the less abundant isotopes of the element is obtained by using tables of isotopic abundance to adjust the ion current.

Concentration of each element in the sample is finally obtained by multiplying the adjusted relative ion current by an ionization factor.\*

**Good as Gas:** Accuracy of the new NBS method compares favorably with gas mixture analysis in mass spectrometers especially designed for that job. Preliminary studies on stainless steel gave results in close agreement with those obtained by chemical methods. In most cases the maximum deviation (from the mean value for five different measurements) was 3% or less. Poorer showing gave a maximum deviation of 5.3%. The Bureau expects its technique to prove feasible for analysis of nonmetallic solids, though perhaps with less accuracy.

**Color Fade:** United States Pottery Association is putting \$50,000 into research designed to seek ways of preventing decalcomanias from fading under modern dishwashing methods. Samuel Stevenson, Harshaw color-chemist, heads up the study.

\* Which takes into account the variation in ion-creating efficiency of the different elements as well as preferential sorting in the analyzer.

#### PICTURES IN THIS ISSUE

Cover (top)—Brown Bros.; pp 11 & 12—Lynd Crawford, McGraw-Hill; p. 13—Lubitz & Bungarz; p. 14—Amer. Welding & Mfg. Co.; p. 15—Downmetal; p. 19—Wide World; p. 20—Natl. Bureau of Standards; p. 23—Wide World; p. 29—Pest Control Ltd.

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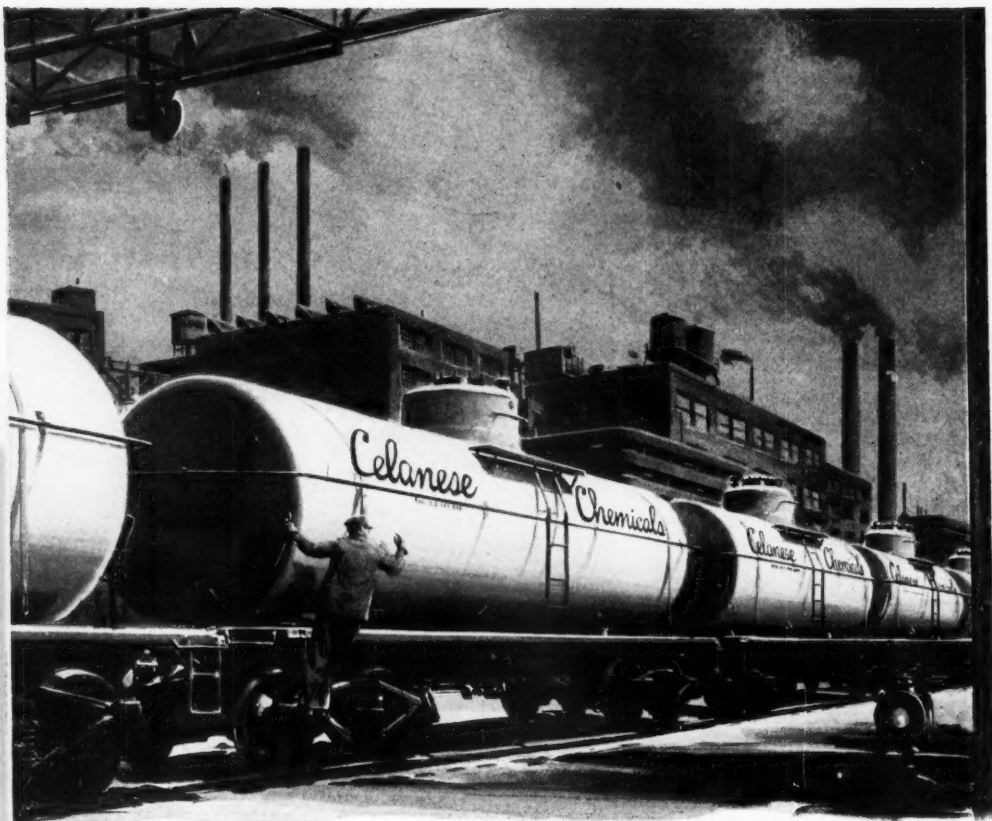
## STANDARD QUALITY

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## INDUSTRIAL STRENGTH NEEDS

# Chemicals

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AMMONIUM NITRATE PRILLING: More uniform and less friable product.

## Quiet Air, Better Prills

World's largest ammonium nitrate prilling (pelleting) plant will be completed in August.

New tower design, a development of Spencer Chemical Co. reduces the wax needed in coating the particles to prevent caking.

August will see completion of the world's largest ammonium nitrate prilling (pelleting) plant, by Spencer Chemical Co. at Pittsburg, Kansas. At that time the second of the two 185-foot prilling towers will swing into full production, bringing the plant capacity to 1,000 tons of prilled material per day.

**Bad Actor:** A major problem in using ammonium nitrate as a fertilizer has been the tendency of the crystals to absorb moisture and cake up into a mass unusable in fertilizer spreading equipment. The answer to this problem was provided in two parts: (1) by the engineers of the Tennessee Valley Authority and (2) by the laboratories of the Consolidated Mining and Smelting Co. (Cominco).

TVA engineers found that crystals of ammonium nitrate could be "parted" by coating the particles with about 1% paraffin, rosin or petrolatum, then mixing with 4% kaolin clay or diatomaceous earth. This was not the whole answer. The large percentage of fines produced by the ordinary crystallization methods still tended to

clog the feed chutes of the fertilizer applicators.

The chutes were opened by prilling, the Cominco development. Prilling consists of the formation of a mass of uniformly sized spherical pellets. The spherical shape provides a minimum of surface for water absorption from the atmosphere and borrowing from the ball-bearing advertisements, "Nothing rolls like a ball". The method used was akin to that employed for years in the production of spherical lead shot. Molten ammonium nitrate is separated into droplets at the top of the tower—either by an orifice or a spinning cup distributor. The particles are cooled while passing down the tall tower and frozen in the spherical shape that they assume because of the surface tension of the liquid. To do this Spencer uses towers that are 185' high.

**Better:** The first prilling towers used had the updraft of air passing over the point of particle formation and out through an annular space just below the roof. In the Spencer towers (U.S.P. 2,528,407) the upcoming air

passes out through louvres placed just below the point where the droplets are formed. Thus droplets form in a section of the tower where the air is quiet. Result: greater uniformity of size and shape.

The toadstool-like appearance in the pictured Spencer towers is produced by the housing surrounding the louvres on the sides of the towers. (Necessary to prevent the outside winds from disrupting the tower's flow pattern—the pressure drop from the top to the bottom of the tower is only  $\frac{3}{4}$ " of water.)

**Too Fragile:** In operation, evaporation raises the concentration of the ammonium nitrate solution to 95% and the molten material from the evaporators is fed directly to the prilling towers. After they are formed the prills are collected by a conical bottom and removed by conveyor belt. At this point the prills still contain about 4% water, are extremely fragile. Fragility is decreased and the water content reduced to about 1% by three hot air dryers, operated in series.

The final step in the processing is to add about 3% of diatomaceous earth. Uniformity of the Spencer-prilled product permits a sizable reduction to be made in the quantity of coating wax.

Product from the plant's first tower met specifications, was loaded into boxcars and shipped out immediately.

## Continuous Furfural

**Employing** hydrochloric acid instead of sulfuric acid as the hydrolysis catalyst, furfural can now be prepared by a continuous process. Higher yields of furfural from pentose-containing materials than those obtained by the present process are claimed by the developers of the process, Profs. G. Natta and E. Beati of the University of Milan.

**Uses a Column:** A hollow vertical column is the heart of the new process. Hydrochloric acid-treated (2-4%) pentose-containing material such as corn cobs or rice hulls are introduced at the top of the column while superheated steam (250-300 C) is injected at the bottom. The superheat of the steam is sufficient to provide a dry residue as it flows from the bottom of the tower. This acid-free residue can be burned under the boilers for steam-raising, sufficient to cover the steam requirements for the operation of the plant.

Rectification within the column provides a higher concentration of

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## PRODUCTION.....

hydrochloric acid in the center of the column and with this almost complete conversion of the pentoses to furfural.

**Acid-Free:** Solid material issuing from the bottom of the column is acid-free. The hydrochloric acid goes overhead with the vapors of furfural and acetic acid. Partial condensation (about 10%) produces a condensate with most of the hydrochloric acid for reuse. The acid in the remaining vapors is neutralized with limestone.

**Acetic Acid Also:** Acetic acid is formed along with the furfural and production can reach 6% of the material treated. The acetic acid yield is said to vary directly with the quantity of superheated steam introduced.

Based on pilot plant data (two tons of raw material per day), Natta and Beati claim furfural yields of 8-10% with rice husks and 12-16% with corn cobs, by weight.

## Chlorine, No Caustic

Solvay's expansion in chlorine production at Hopewell, Va. is unique. About 28 additional tons of chlorine per day will be recovered without production of caustic soda. The required \$2,150,000 (value of the certificate of necessity) will provide a unit to convert nitrosyl chloride from the present chlorine plant to chlorine and nitrogen tetroxide by an oxidation process. Separation will be by partial condensation.

**Start—Sodium Nitrate:** Solvay's original plant at Hopewell, completed in 1936 and doubled in 1942 converts salt and nitric acid to sodium nitrate and chlorine, nitrosyl chloride and nitrogen tetroxide. A concentrated solution of sodium nitrate passes off the bottom of the reaction tower while the rest of the products emerge as vapors from the top of the tower. This gaseous mixture moves into a second tower where chlorine comes out of the top and liquid nitrosyl chloride containing from 4-10% nitrogen tetroxide at the bottom.

The nitrogen values of much of the nitrosyl chloride are now recovered as sodium nitrite by absorption in a sodium carbonate solution. Another portion is recycled to the system and part is recovered for use in synthesis of Solvay's synthetic detergent, Nytron. This is formed in two steps (1) by reacting nitrosyl chloride with a long-chain olefin fraction and (2) combining this product, a nitroso chloride with sodium bisulfite.

**Chlorine, Up 50%:** Chlorine will now be produced from the nitrosyl

chloride which was previously recycled, adding roughly 50% to the plant's chlorine capacity. Absorption of the nitrogen tetroxide in water forms further nitric acid for reaction with more salt.

**No More:** This process, as far as it goes is ideal—no caustic soda is produced with the chlorine. However, there is a very definite upper limit on the amount which can be produced in this manner—the market for sodium nitrate. Thus it is questionable if more chlorine will be supplied by this means unless there is an unforeseen increase in the market for sodium nitrate.

**Pilot Plant:** Rodney Hunt Machine Co. has installed a pilot plant for the testing of their evaporators and spray driers at Orange, Mass. Eleven thousand square feet of floor space in the new laboratory is devoted to this type of test operation.

**Centrifugal Pump:** Easy removal and inexpensive replacement of all wearing parts is featured in a new line of self-priming centrifugal pumps manufactured by Chain Belt Co. All wearing parts are accessible after removal of a single cover plate. Sizes available range from 1½" to 6" IPS. Capacities range from 4,000 to 90,000 gallons per hour.

**Mixer:** Sixteen standard mixing speeds are obtainable from a new model propeller-type mixer, developed by Mixing Equipment Co., Inc. A simple change, requiring only a few minutes, changes from one speed to another. Speeds obtainable range from 16.5 to 420 rpm; sizes from 1 to 500 hp.

**Flow Control Valve:** Ready control of the rate of bin output is provided by a new bin valve, the development of the Syntrol Co. A flexible diaphragm, whose operation is similar to the action of the iris in a camera, does the job. Rotating a control lever increases or decreases the opening and the flow of material. Fabric diaphragms are available in five different sizes to fit openings up to 12" in diameter.

**Temperature Controller:** A new inexpensive, and sensitive, electronic temperature controller is now being produced by Pehn-Trols, Inc. A setting on the dial will maintain the pre-selected temperature within ±0.5 C. The unit is actuated by a single stainless steel-covered thermocouple unit. Loads up to 3,000 watts are handled.

# SPECIALTIES . . . . .



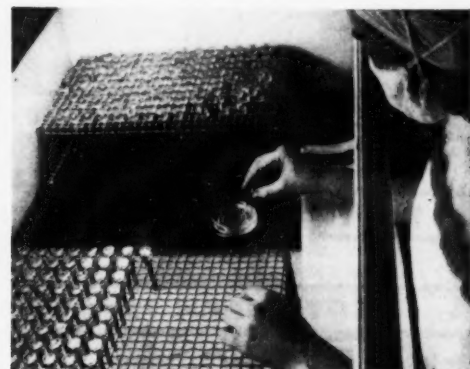
**PRINTING** name and data on glass ampoules is first step in manufacture of atropine anti-nerve gas Ampins.



**ENOUGH AMPOULES** for a regiment of GI's ready for washing and heat-treating prior to filling and sealing.



**ASSEMBLING TNF UNIT**—tube, needle, filter and cover—into which ampoule will be fitted to make Ampin.



**FILLED AMPOULE** (rt. rack) is lubricated prior to slipping TNF unit (supply at left not visible) over it.

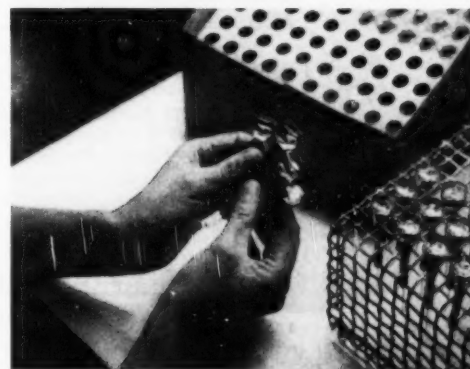
## Defense Line Against Nerve Gas

The threat of nerve gas attack by potential U.S. enemies is keeping Strong-Cobb, Cleveland drug manufacturer, busy turning out atropine Ampins for defense needs. And although production is of necessity almost entirely a "hand" operation, the process has been so well organized that millions of these life-savers are being turned out efficiently.

Ampin, a Strong-Cobb development, is a trade name for a disposable single-use hypodermic syringe. It has been modified to add to its usefulness in dispensing nerve gas antidotes and other emergency drugs. Atropine is a known antidote for nerve gases.

Sterile ampoules are filled with 2 mgs. atropine solution, distilled water for which is tested for pyrogens (*see cover*), plus helium, and sealed. These are fitted into TNF units—tube, filter (for glass when ampoule is broken), needle and glass cover for the needle—to make a finished Ampin. After inspection, there is a two-week quarantine period for tests prior to shipping.

In use, needle is inserted in a muscle and the glass tube inside the rubber tube is broken, permitting gas to eject atropine into victim's arm.



**INSPECTION** of finished Ampin—disposable single-use hypodermic syringe—before storage in quarantine.





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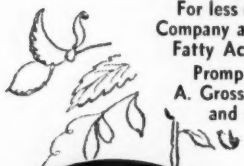
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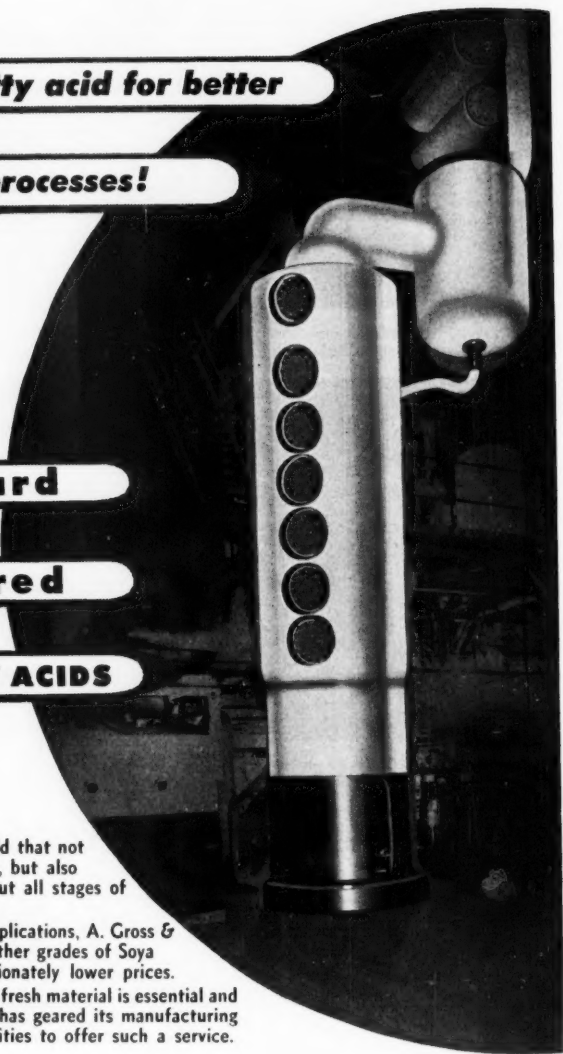


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CHLOROPHYLL: From alfalfa, bumper crop of specialties.

## Accent on Scent

Chlorophyll bites into \$54 million market for deodorants and mouth washes as brands of internal deodorants and breath-chasers multiply.

Types of chlorophyll-containing products on the market: tablets, breath candies, mouth washes, tooth-paste, chewing gum, face cream, ethical ointments.

All this spells booming demand for chlorophyll, has brought two new producers into the field.

Latest "big sell" in retail chemical specialties is chlorophyll, a substance that has been underfoot since creation but which began blossoming out in a variety of products only within the past year. Now it is being added to a growing number of specialty items, and receiving capital-letter, top billing on labels and in ad copy.

Less than a year ago, major chlorophyll markets were soaps (colorant) and wick-type room deodorants. Business was so bad that Valley Vitamins (Godfrey Cabot subsidiary), already having trouble with sea water encroachment on its McAllen, Texas, alfalfa (from which chlorophyll is extracted) fields, closed its plant. For a while American Chlorophyll, Inc. (Lake Worth, Fla.) was the sole major producer.

Booming demand for chlorophyll in internal deodorant tablets, breath candies, mouth washes, toothpastes, chewing gum and even facial cream,

changed the picture. The outlook is now rosy enough to have brought two new producers bounding into the field: Keystone Chemurgic Corp. (Bethlehem, Pa.) and National Alfalfa Dehydrating & Milling Co. (Lamar, Colo.).

First of the newer chlorophyll products to reach the market (about two years ago) were ethical ointments consisting of an isotonic solution of chlorophyll A in a petrolatum or lanolin base. Among these forerunners were Chloresium Ointment (Rystan Co., Mount Vernon, N.Y.) and Chloro-aqua (Chlorophyll Products Co., Chicago).

**Internal Control:** Greatest impact in the current surge, however, has been on the deodorant business, where chlorophyll-containing tablets to be taken internally for body odor control have moved in on deodorant creams and sprays, and preparations containing smaller amounts of chloro-

phyll are doing battle with conventional mouth washes. Among the former are Klore Tablets (Preston Labs, Chicago), Nullo (DePree Co., Holland, Mich.), Ennds (Pearson Pharmacal, New York), Odorlex (Walker Vitamin Products, Mount Vernon, N.Y.), Chloresium Powder (Rystan Co.), Squairs (Chlorophyll Products), Carto-Phyll (Carter Products, New York), Sudroma (Charles E. Frost, Montreal), and Voids, (Voids, Ltd., Toronto). Among the latter are Chlorefix (Woodley Co., Chicago), Stoppers (Stoppers, Inc., New York), B-Sure (Danmar, Inc., St. Louis), Swish (Boray Pharmacal Co., Brooklyn, N.Y.), and Kloro Mouth Wash (Preston Labs).

Manufacturers of conventional deodorants pooh pooh claims of some of the chlorophyll advocates that they have taken over 25% of the business. They question the efficacy of the pills, cutely ask "Why, if chlorophyll tablets are so effective, does a cow, eating grass each day, still smell?" The chlorophyll boys claim they have clinical evidence dating back to the 'thirties showing that chlorophyll nullifies body odors, but they don't know why it works.

The rise of chlorophyll deodorants has caused less concern among anti-perspirant makers than among manufacturers of bactericidal-type deodorants, for the former feel that their customers still want perspiration prevention for daintiness and fabric protection. Because chlorophyll deodorants don't stop perspiration (one of chlorophyll's strongest selling points), the anti-perspirant camp thinks the newcomers will probably build up a new market, especially with men, while anti-perspirants will hold their own with the ladies.

**FDA-Free:** Those on the chlorophyll bandwagon point out the old irritation bugaboo of anti-perspirants as compared with their non-toxic tablets (they need no Food and Drug clearance), also argue that perspiration blocked in one specific area is excreted elsewhere, so odor protection is incomplete. As to fabric protection, they are hopefully eyeing the "bacteriostatic" property of their product. Sterile perspiration is odorless and acidic; the action of skin bacteria decomposes the perspiration and makes it alkaline, giving rise to odor and the harmful effect on fabrics. If bacteriostatic action of chlorophyll can keep perspiration acidic as well as odorless, the fabric protection problem may be solved. As yet they don't have the answer, and perspiration, harm-

# WHERE you get it... DOES make a difference



When you place your order with Barrett you're assured prompt, dependable service and top quality products, backed by 96 years of successful manufacturing experience.

## WHEN YOU NEED A COAL-TAR CHEMICAL

Phenols  
Cresols  
Cresylic Acids  
Chlorinated Tar Acids  
Xylenols  
Pickling Inhibitors  
Benzol  
Toluol  
Xylol  
Naphthalene  
Hi-Flash Solvent

Phthalic Anhydride  
Dibutyl Phthalate  
ELASTEX\* DCHP Plasticizer  
"ELASTEX" 10-P Plasticizer  
"ELASTEX" 50-B\* Plasticizer  
"ELASTEX" 28-P Plasticizer  
Phenolic Resins  
Niacin (Nicotinic Acid)  
Pyridines  
Picolines  
Quinoline

Lutidines  
Tar Acid Oils  
Neutral Coal-tar Oils  
Coal-tar Creosote  
CUMAR\* Paracoumarone-  
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Oil  
Flotation Agents

\*Reg. U. S. Pat. Off.

GET IT FROM...



**THE BARRETT DIVISION**

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

## SPECIALTIES . . . . .

less or not, is going to show on clothes, leaving the anti-perspirant boys with a strong sales argument.

Members of the chlorophyll deodorants industry have engaged in little intramural competition, placing initial emphasis on educating the public to the effectiveness and non-toxicity of their products instead of pushing brand identification. An additional obstacle to be surmounted: their relatively high price. Most brands sell at about 36 tablets for \$1.25, considerably more costly on a daily basis than creams or liquids.

**From the Fields:** Alfalfa is the usual raw material, although chlorophyll can also be extracted from other chloroplast bodies with a fat solvent. With it come carotene, xanthophylls, phosphatides, glycerides, waxes and sterols. Intended use dictates the degree of purity necessary. Fractionation is the method and degree of purity determines price. Other pigments must be removed if it is to be used as a dye, but in pharmaceuticals the other lipoids can remain since they don't interfere with chlorophyll action. This fat-soluble form can be used directly as a colorant in fats and similar materials. The water-soluble form is prepared by saponification with caustic, which splits off the lipophyll groups and results in a chlorophyllin or metallic salt of chlorophyll. Chlorophyllin is most soluble in alkaline solutions, but precipitation can be prevented in mixtures below pH 6 by using emulsifiers.

At present the FDA is investigating the use of the term "specially prepared" chlorophyllins which involves a precipitation by acidifying a solution. Some manufacturers use this term, while others state that the 100 mg. of "specially prepared" chlorophyllins are equivalent to 16 mg. sodium chlorophyllin.

The deodorizing action of chlorophyll was discovered accidentally by separate investigators using chlorophyll derivatives in treatment of secondary anemia and suppurative (pus-forming) wounds. Its structural relationship to hemoglobin prompted this research with the result that chlorophyll has been reported effective but impractical in anemia treatment, as well as a stimulant to epithelial growth, a cell-stimulating bacteriostatic agent and a non-toxic deodorizing compound.

One theory of chlorophyll's deodorizing action was offered by the late Dr. Benjamin Gruskin who published the results of 1,200 cases demonstrating therapeutic uses of chloro-

phyll. He suggested that chlorophyll breaks down CO<sub>2</sub> and sets free oxygen which tends to inhibit the action of anaerobic bacteria. In cases of ulcerative cancer, for instance, Dr. Gruskin reported that the obnoxious odor characteristic of the disease was probably due to secondary bacterial infection and change of proteins into peptones. He believed chlorophyll treatment cleared up this secondary infection and, in addition, stimulated products of connective tissue in their regrowth. Present investigators, not wholly sold on this theory, are starting with the fact that chlorophyll has a deodorizing action, and working backwards.

**Solid Standard:** No matter how the material works, there is no discounting its current boom as evidenced by the number of new products appearing on the market. And not all of these are straight deodorants.

Chloresium toothpaste, an offshoot

of Rystan's ethical ointment, is a 75¢ retail item (2 oz. tube). Another toothpaste, Chlorogene, is being test marketed by Lever Bros. (*CW News-letter*, May 12, 1951.) Among chewing gums are Crawford's Chlorets similar to Chiclets at 15¢ a box (American Chicle) and Clorolin (Universal Co., Chicago). Chloro-Creme (Dearborn Supply Co., Chicago) is a facial cream with "tingling" action said to represent skin vitalization.

One cigarette company is reported to be experimenting with chlorophyll as an additive in tobacco and papers to produce mildness and reduce irritation. And chlorophyll advocates are even giving the dog population a second look. One vet preparation, Chlorodor (Ditman-Moore), is on the market, and there is a move to put the material in dog and animal foods. Some canines view this darkly; others, hoping to get out of the dog house and back in the parlor, rejoice.

## Another Systemic from England

Now in the semi-commercial stage, **Isopestox**, a systemic insecticide\* less toxic than Pestox 3, will soon be in full-scale production in England. It is recommended for control of aphids on cabbage, Brussels sprouts, lettuce, spinach; aphids and red spiders on hops.

Just a little over a year after launching the first commercial systemic insecticide, Pestox 3, Pest Control Ltd., Harston, Cambridge, England, has introduced a new, far less toxic insecticide called Isopestox. The company describes it chemically as bis isopropylamino fluorophosphine oxide. (Pestox 3 is octamethyl pyrophosphoramide.)

The pure chemical is a solid, melting at 60 C. and is very hygroscopic. It is formulated, therefore, as an anhydrous solution containing 50% active material. It is non-volatile, doesn't smell, and isn't corrosive. About 26 times less toxic than parathion, it is a little more than twice as toxic as DDT.

Isopestox is not selective when sprayed on plants, but it will kill aphids, red spiders, thrips, white fly and their larvae, scale insects and mealybugs. As it is non-volatile, it has no fumigating action. It can be used as a selective insecticide if applied to the roots, for it is well translocated by the plant. Application is

by spray at the rate of ½-1 lb. per 100 gallons of water per acre.

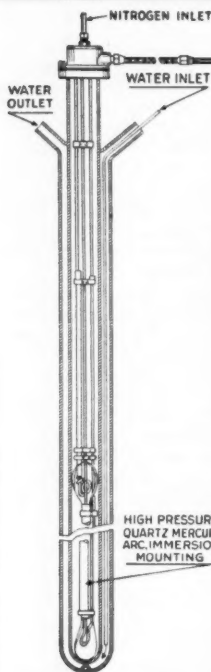
Pest Control feels that Isopestox' usefulness lies in: (1) Treatment of crops infested with insects not killed by Pestox 3, and (2) Treatment of crops nearer to harvest time than is possible with Pestox 3.

Commercial use of either Pestox 3 or the new insecticide in this country must await approval by the U. S. Department of Agriculture. Dow has handled domestic sales of Pestox 3—for experimental applications only—will probably also handle Isopestox.



**INSECTICIDE LAB:** Research on Pestox yields a safer systemic.

\* Systemics render plants lethal to insects upon absorption by plants and translocation throughout plant systems.



## ULTRAVIOLET AS A CATALYST

**... saves time ... reduces costs  
... increases production**

Numerous processes have been developed employing ultraviolet lamps to promote such reactions as photochlorinations, oxidations, hydrolysis, polymerizations, brominations and decompositions. Lamp fittings of special design are available to permit the use of the tubes to maximum efficiency when installed within reactor kettles and other types of photochemical apparatus.

More and more chemical plants are profitably and economically using modern photochemical processing.

In this field HANOVIA offers modern equipment produced as the result of many years of experience in this specialized field. The number of possible applications of ultraviolet activated processes is limitless. Many new products have been developed which cannot be duplicated by any other procedure.

*We shall be pleased to send you all available data as it may apply to your problems.*

SPECIAL PRODUCTS SALES DIVISION

**HANOVIA** CHEMICAL & MFG. CO.  
DEPT. D, NEWARK 5, N. J.

## SPECIALTIES . . . .

**Chlordane Suit:** In an appeal brought to the Colorado Supreme Court by Julius Hyman Co., Denver, in its suit with Velsicol Corp., Chicago, over manufacturing rights to the insecticide chlordane, the Court confirmed with modifications a \$1.5 million judgment against Hyman. Hyman cannot manufacture or market chlordane, discovered by Julius Hyman, head of the company bearing his name, when he was research director for Velsicol. The judgment was reduced by \$300,000, the amount Hyman had paid as Federal income taxes. In addition to the \$1.2 million—the adjusted amount—Hyman must reimburse Velsicol for profits prior to the first trial, it must pay about \$1 million profits of 1950.

**Static Stopper:** Anstac M is a new liquid anti-static and cleaning agent developed for use on methyl methacrylate by Chemical Development Corp. (Danvers, Mass.).

**Insecticide Bill:** A new Tennessee economics poisons law requires June 1 annual registration of each such product sold within the state. Now in effect, the regulation also calls for an annual fee of \$5 for each brand.

**Nylon Finish:** Vibralon is the trade name of a new nylon hosiery finish developed by W. F. Fancourt Co. (Philadelphia). It is claimed to impart a very dull finish to nylon stockings, to provide better-than-normal moisture absorbency.

**Refractory Coating:** A new refractory coating said to be as easy to apply as paint has been developed by the Power Chemicals Division of E. F. Drew & Co. (New York, N.Y.). It is claimed to dry to a diamond-hard finish that will not crack off or flake.

**Heat-Resistant Lacquer:** United Lacquer Manufacturing Corp. (Linden, N.J.) has developed a one-coat lacquer that can be used for temperatures up to 300 F. It air dries in 15 minutes, comes in all colors, in flat, semi-gloss and gloss.

**Plough Purchase:** Purchase of all capital stock of August E. Drucker Co., San Francisco manufacturer of Revelation Tooth Powder, gives Plough Inc., Memphis drug producer, access to West Coast and Pacific export markets as well as a new product. Machinery of Drucker's plant will be moved to Memphis where Plough will make the tooth powder; the building, however, will be retained as a distribution point.

# 25

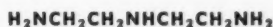
**CHEMICALS**  
for the  
**FLAVOR and EXTRACT MANUFACTURER**

CHEMICAL DEPARTMENT  
**McKESSON & ROBBINS**  
INCORPORATED

NATIONWIDE DISTRIBUTORS OF HEAVY AND FINE CHEMICALS

**Build future business  
with products from**

# Diethylene Triamine



Diethylene Triamine reacts with acidic materials, such as fatty acids, to form soaps that may be dehydrated first to amides, then to glyoxalidines. It is a good solvent for many resins and dyes.

## Its present uses include:

- A catalyst activator in emulsion polymerization of synthetic rubber and vulcanization of foam rubber.
- A catalyst for epoxide-type casting resins.
- An anti-living agent for varnishes that are based on either phenolic resins or alkyd resins.
- Making—corrosion inhibitors
  - emulsifiers
  - emulsion breakers
  - wetting agents
  - ion-exchange resins
  - textile-finishing agents
  - asphalt additives

## Try this versatile chemical now.

Call or write the nearest Carbide and Carbon Chemicals office today for samples or technical information on Diethylene Triamine.

**Did you know** that CARBIDE makes 68 other nitrogen compounds, including dimethyl ethanolamine, N-acetyl ethanolamine, and N-aminopropyl morpholine. For a complete list, ask for a copy of the booklet "Physical Properties of Synthetic Organic Chemicals," F-6136.

## PHYSICAL PROPERTIES

Molecular Weight.....	103.17
Specific Gravity at 20/20°C.....	0.9542
Boiling Point at 760 mm. Hg.....	206.7°C.
Vapor Pressure at 20°C.....	0.2 mm. Hg
Freezing Point.....	-39°C.
Solubility in Water at 20°C.....	complete
Absolute Viscosity at 20°C.....	7.1 cps.
Flash Point (Cleveland open cup).....	215°F.

## CARBIDE AND CARBON CHEMICALS COMPANY

A Division of  
Union Carbide and Carbon Corporation  
30 East 42nd Street **UNION** New York 17, N. Y.

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Carbide and Carbon Chemicals, Limited, Toronto.



# FACTS about PHENOL

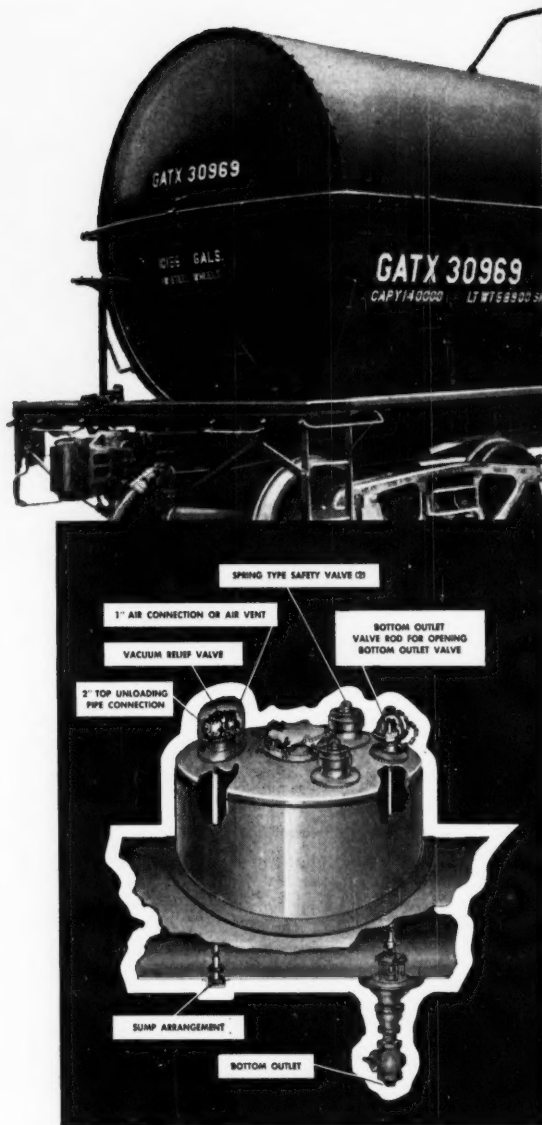
IN times of shortages, additional effort should be expended to use materials efficiently and wisely. The importance of phenol in so many industries has lead Dow to believe that the following information may be of assistance in helping you realize greater value from phenol.

Phenol is used in many manufacturing processes. It is used in the manufacture of: bonding agents for plywood—thermo-setting type plastics—toluene—lubricating oils—lubricating oil additives—medicinals—dyes—perfumes—explosives.

Dow believes that complete and comprehensive information about phenol is extremely valuable at this time and is ready to help you further with advice and technical assistance. If you desire additional information, write to Dow, using coupon below.

## 1. Top unloading by pumping

(1) Remove housing covering 1" air vent valve and 2" top unloading pipe valve. (2) Vent the car carefully by opening the 1" vent valve. To make sure that car is vented, open manhole cover bolts one turn at a time until cover is loose. If there is no pressure present, open manhole cover. (3) Connect low pressure steam to car heating coils. (4) Avoid heating contents of the car above 70°C. Phenol should be ready for unloading when the bottom and ends of the car are warm to the hand, providing the car is not insulated. (5) Remove the plug from the 2" top unloading valve and make sure that there is no unmelted phenol or foreign matter obstructing it. (6) Connect discharge side of pump to line running to the storage tank. Storage tank should be well vented. (7) Connect unloading line to the suction side of pump. The manhole cover may be left open for inspection. (8) Disconnect the piping after phenol has been pumped from car and wash off any phenol. Close all dome openings and blow out steam coils to prevent any residual condensate freezing and bursting the coils. Do not

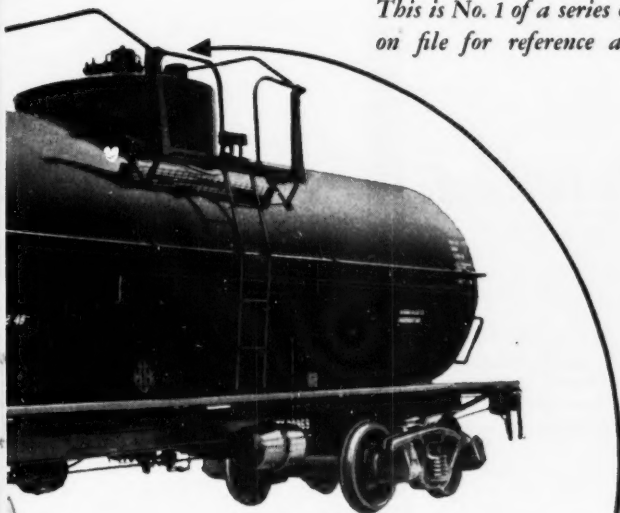


replace steam inlet and outlet caps. (9) Turn "Dangerous" placard to indicate empty car now is ready to return to Dow.

## 2. Top unloading by air pressure

Prepare the car for unloading by following items (1) through (5) under top unloading by pumping. Then: (6) Close manhole cover and bolt securely in place. (7) Connect the unloading line to the 2" top unloading pipe connection. Be certain the storage tank is vented. (8) Connect the air supply line (air pressure not to exceed 20 p.s.i.) to the 1" vent valve. (9) Observe the same procedure after the car is empty of phenol as before.

*This is No. 1 of a series of Dow advertisements you may wish to keep on file for reference and information. Write Dow for reprints.*



### UNLOADING PHENOL TANK CARS

Be sure that tank cars stand on a level section of track in order to assure complete unloading of the car. Either of the following two methods may be used, but the first, *top unloading by pumping* is the safer, and the one recommended.

### Physical Properties of Phenol

Phenol is a white crystalline chemical compound with an easily recognized aromatic odor.

Molecular Weight .....	94.11	Heat of Fusion .....	2690 cal./g. ml. 28.6 cal./g. 51.5 B.t.u./lb.
Congeeing or Freezing Point .....	40.9°C.	Heat of Vaporization at 182°C. ....	103.4 cal./g. 186.1 B.t.u./lb.
Boiling Point at 760 mm. Hg. ....	182.0°C.	Heat of Combustion .....	732 K. cal./g. ml. 79.0°C.
Density		Flash Point .....	79.0°C.
Solid—at 25°C. ....	1.071 g./ml.	Solubility	
Liquid—at 50°C. ....	1.049 g./ml.	Water in Phenol at 25°C.—	71.28 g./100 g. solution
Critical Points		Phenol in Water at 25°C.—	8.66 g./100 g. solution
Critical Temperature .....	419°C.	Phenol is soluble in all proportions at room temperature in alcohol, benzene, monochlorobenzene and ether.	
Critical Pressure .....	60.5 Atmospheres		
Specific Heat			
Solid—at 4.0°C. ....	0.306		
—at 22.7°C. ....	0.338		
Liquid—70-74°C. ....	0.548		
Viscosity			
Liquid at 45°C. ....	4.0 centipoises		

### STORAGE



In solid state, phenol may be stored in the original container for considerable time without discoloration. Molten phenol, however, discolors when in contact with iron or copper-bearing metals. The higher the temperature, the more rapid the discoloration.

Storage tanks may be either welded or riveted construction. Tanks are usually equipped with steam coils for melting the phenol (temperatures should not exceed 70°C.) for transfer.

### TRANSFER



When molten, phenol can be transferred like any other liquid, by gravity, pumping or blowing. Centrifugal and turbine type pumps are generally used and are satisfactory. A pump manufacturer can recommend suitable equipment when your requirements are known. Long fiber asbestos, lubricated with graphite, gives reasonable service when used as a pump packing. Pipe lines for handling phenol should be heated to maintain it in a liquid state. Steam-traced lines are usually used. Outside pipe lines in cold climates should be traced with  $\frac{3}{8}$ " to  $\frac{1}{2}$ " steam lines dependent on the length of run and size of the line to be heated, with the tracer along the bottom of the pipe line, and both covered together with standard pipe covering. Short runs inside heated buildings should be traced on the under side of the pipe line, but need not be covered to keep the phenol above its melting point if more than 100 p.s.i. steam is used in the tracer line.

### PRECAUTIONARY MEASURES



Phenol produces painful and dangerous burns of the skin in a very short time and death may result from external contact even on an area as small as the hand and forearm. It is classified by the Interstate Commerce Commission as a Class B poison and all containers bear the prescribed "DANGEROUS" placard or "POISON" label. Fumes are irritating to eyes and nose.

Persons engaged in handling phenol should always wear goggles or face shields and rubber gloves. Additional protection such as rubber boots, aprons and hoods may be advisable.

There should be adequate washing facilities immediately available. These facilities should include a shower bath or a water hose which gives a large stream of water under low pressure. For washing eyes, use a flow of water under low pressure.

In case phenol is spilled, it should be thoroughly washed away with water. Torches or heat sources other than low-pressure steam should never be used on phenol containers. No workman should ever be permitted to enter an empty tank or car which has been used for phenol until it has been thoroughly washed out, followed by a thorough steaming for approximately 12 hours.

In case of accidental contact: 1. Begin a thorough washing with large volumes of water. 2. Remove all contaminated clothing. 3. Call a physician.

*If you have a Phenol problem*

write DOW for information and technical assistance

THE DOW CHEMICAL COMPANY  
Midland, Michigan

The Dow Chemical Company, Dept. OC-4,  
Midland, Michigan

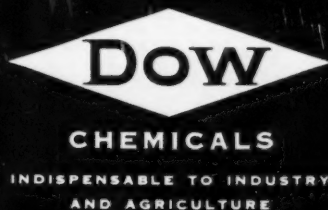
- ☐ Please send me literature about phenol.  
☐ Please send \_\_\_\_\_ reprints of this advertisement.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_



# Now—Simpler, Faster, Automatic Titrations!

## The BECKMAN Automatic TITRATOR

**SIMPLE OPERATION:** In a series of titrations, simply fill the burette, place the sample in the beaker—and the Beckman Automatic Titrator takes over from there. Raising the beaker holder into position automatically starts the stirrer motor and begins delivering titrating solution into the sample.

A special circuit electrically anticipates the approaching end point, scaling down delivery of the titrating solution in progressively smaller increments to assure a highly accurate titration. When the end point is reached, delivery of the titrating solution stops and a light shows completion of the titration—all automatically and without attention from the operator.

Whether your laboratory is large or small the Beckman Automatic Titrator provides important advantages in your titrating operations...

► It releases the technician during titration, enabling him to perform other operations

Here's another new Beckman advancement in instrumentation—an instrument that runs your titrations for you. It's the Beckman Automatic Titrator—the instrument that makes accurate titrations more rapidly and conveniently than by manual methods.

such as preparing samples, or calculating results.

- It eliminates the fatigue caused by close observation required in manual procedures.
- It gives objective, reproducible results... eliminates errors due to personal factors.
- It provides time-saving conveniences for sample handling.

PERFORMS A WIDE VARIETY OF TITRATIONS—Neutralization, Oxidation-Reduction, Precipitation, Complex-Formation and other types.

NO SPECIAL TRAINING IS REQUIRED—rapid and accurate titrations can readily be performed without special skill or technique.

QUICK, SIMPLE OPERATION—completes many routine titrations in only 1-1½ minutes—even titrations to 0.1% accuracy in 2½ minutes or less. Change of sample is simple, rapid—a single motion raises, locates and secures new sample in operating position.

CONVENIENT, VERSATILE, ADAPTABLE—0° to 100° C temperature compensation... adjustable holder accommodates 10 ml to 400 ml beakers or similar vessels... instrument may be used with all standard burettes down to 5 ml... as many as four delivery units accommodated by single amplifier control unit... uses standard Beckman electrodes... electrode holders and delivery tip can be pivoted into any required position... ample provision for mounting heating devices or other special equipment.

ALSO A RELIABLE pH METER—the Beckman Automatic Titrator can also be used as an AC-powered pH meter to give accurate readings over the range 0 to 14 pH, as well as millivolt readings from -600 to +1400 mv.

*A New Beckman  
Instrument  
to save time and labor  
in your laboratory*

For full details on this new Beckman instrument see your authorized Beckman dealer—or write direct.

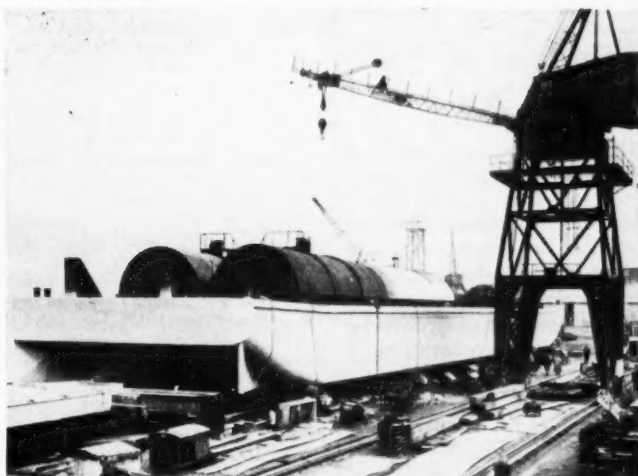
Beckman Instruments, Inc.  
South Pasadena 17, California

Factory Service Branches:  
NEW YORK — CHICAGO — LOS ANGELES

**BECKMAN INSTRUMENTS**  
control modern industries

Beckman Instruments include: pH Meters and Electrodes — Spectrophotometers — Radioactivity Meters — Special Instruments

# SHIPPING . . .



LTC 39: Provides solution to problem of handling viscous liquid by . . .

## Keeping It Hot

Dravo Corp. has a new answer to the old problem of unloading viscous materials from barges. Previously shore steam was used to bring the substance up to proper handling temperature. But Dravo's barge tanker (built for Lake Tanker Corp.) is specially insulated to avoid excessive temperature drops during lengthy shipments. Satisfied with the results of extensive tests runs, this week Dravo is preparing to build more tank barges for any interested consumer. And although the one in use by the Lake Tank Corp. (LTC 39) was designed for transporting lubricating oil blending stock, the same principle of design could be adapted for any chemical that presents handling difficulties because of high viscosity at low temperatures.

Original tests on LTC 39 were made on a run between Cabin Creek (W. Va.) and Good Hope (La.). Loading temperatures in the six compartments ranged from 98 F to 130 F, outside temperatures as low as 15 F were encountered. At the end of the 15-day trip, the maximum temperature drop in the compartments was 24 F.

At more normal temperatures and on shorter trips, performance tests were even more convincing. For example, on one trip from Houston to New Orleans (4 days at outside temperatures averaging 75 F), one grade of stock was loaded at 95 F and lost one degree in transit. Another grade was loaded at 86 and unloaded at 83 F.

LTC 39: The 240 ft. welded steel barge was built by Dravo engineers in cooperation with Lake Tanker. Four tanks (39.5 ft. long and 16 ft. in diameter) each have a capacity of 1400 barrels. The larger tanks (45.5 ft. long, 16 ft. diameter) have a capacity of 1600 barrels each.

Insulation was accomplished by means of mineral wool boards 1½ in. thick. On top of the boards metal lath was placed, and surfaces were covered with a thick vinyl plastic coating and two coats of asphalt mastic. A cotton membrane was laid into the first mastic coat (2 gal. per 100 sq. ft.). A finish coat of mastic (4 gal. per 100 sq. ft.) was applied over the membrane to complete the insulation.

On standard barges the temperature of the oil at destination is frequently as low as 65 F. This means that almost always shore steam is necessary to raise the temperature. LTC 39 is designed to insure a temperature drop of not more than 20 F for a six-day trip.

The specification of 1½ in. layer of mineral wool board was based on a number of factors. Among the variables that had to be considered: loading temperatures, unloading temperatures (90 F was figured as an approximate minimum), and the nature of the oil itself. As an added precaution, LTC 39 is equipped with steam coils to distribute shore steam on unloading. Tests show the coils will be used on rare occasions only.

## LITHIUM FORMS Pioneered by METALLOY...



To Aid Industry, Metalloy Has Pioneered the Manufacture of Lithium in These Forms:

Lithium Metal	
Cup	1.5 lb.
Extruded Rod	1/8" & 1/4" Dia. Shot
Wire	1/8" Dia. Ribbon
Cartridge	(Extruded in Copper Tubing)
	4.56" 2.0 & 100.0 Gram
Lithium Hydride	
	Fine Ground
Lithium Amide	
	Crystalline

**SPECIALISTS.** Metalloy has developed special forms of Lithium and Lithium Compounds for many specialized applications. Check this list of ever expanding Lithium Salts, exclusive with Metalloy:

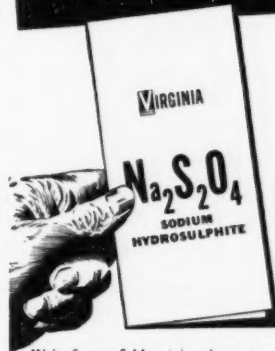
### LITHIUM

Aluminate • Cobaltite • Manganite • Silicate  
Titanate • Zirconate • Sircanion • Silicate  
AS A CONTRIBUTION TO ORGANIC RESEARCH, Metalloy's technical staff has prepared an "Annotated Bibliography on the use of Organolithium Compounds in Organic Synthesis." Annual Supplements will follow. Let Metalloy and Lithium go to work for you today. Write Dept. A for specific data on any of the above.  
IF IT'S LITHIUM — IT'S METALLOY

## METALLOY CORPORATION

HAND TOWER MINNEAPOLIS, MINN.  
SODIUM HYDRO SULPHITE  
JAMES INC.

"VIRGINIA"  
SODIUM HYDRO  
DOES IT!

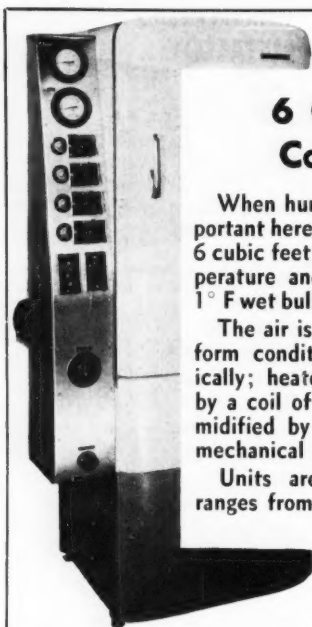


Write for our folder giving the properties and applications of "Virginia" Sodium Hydrosulphite. VIRGINIA SMELTING CO., Dept. CI, West Norfolk, Va.

**VIRGINIA**  
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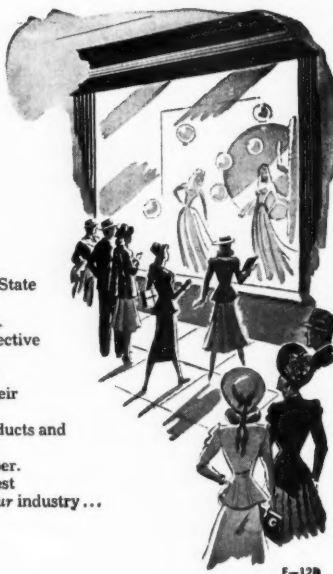
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**McGraw-Hill PUBLICATIONS**

## BOOKS . . .

**Preparation of Organic Intermediates**, by David A. Shirley. John Wiley & Sons, Inc., New York, N.Y.; 328 pp., \$6.

To aid the busy chemist or laboratory man this volume offers specific directions for the preparation of more than 500 useful organic compounds, all of which are either commercially unavailable or relatively expensive. Compounds selected are those having a simple structure and containing reactive functional groups which would make them useful as intermediates, or those whose preparation involves a generally useful type of organic reaction. Three indexes are included—a molecular formula index, type of reaction index and a general one.

**Radiochemical Studies: The Fission Products**, edited by Charles D. Coryell and Nathan Sugarman. McGraw-Hill Book Co., New York, N.Y.; 2086 pp., \$18.50 per set.

Comprising 336 research papers, this report presents a technical account of information collected while developing methods for producing plutonium. Written during the war years as part of the work of the plutonium project, these reports deal with technical processes that were performed in preparation for making the plutonium. This work is divided into eight parts and covers such topics as counting techniques, chemical studies at tracer levels, radioactivity of the fission products, radiochemistry of fission-product elements, etc.

**Organic Chemistry**, 2nd edition by Frank C. Whitmore. D. Van Nostrand Co., Inc., New York, N.Y. ix+1005 pp., \$12.

This is a reference-text for those with knowledge and experience in organic chemistry; stress is on aliphatic and alicyclic chemistry in correspondence to the trend in this direction in both British and American industry. In the present edition terpenes, alkaloids and dyes have received special attention but like in its predecessor, general principles have been stressed throughout, and no attempt has been made to discuss the application of analytical and physical principles to organic chemistry.

### Briefly Listed

CROSS-INDEX to English translations of Russian chemical journals contains four sections—titles of papers, author index, subject index, and index to organic compounds; journal covered here is "Journal of General Chemistry of the U.S.S.R." (Vol. 19, 1949). Available from the Con-

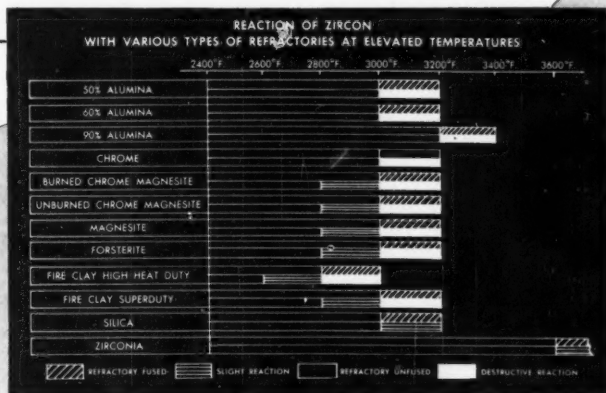


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## BOOKS . . . . .

sultants Bureau, 152 West 42nd St., New York 18, N.Y. at the price of \$2.50.

SCHIMMEL BRIEFS, covering from April 1935 to December, 1950, set of 200 technical papers containing over 400 individual monographs all devoted to the reporting of important developments in technology relating to the manufacture of perfumes, soaps and cosmetics. Can be acquired from Schimmel & Co., Inc., 601 West 26th St., New York, N.Y., at the price of \$7.50.

THE POTASH INDUSTRY, an 83-p. analysis of recent developments in the economics of the potash industry with particular reference to Carlsbad, New Mexico, by Louis Havner Kurrelmeyer. Published by the Division of Research of the Department of Government of the University of Mexico and selling for \$1.50.

TRANSPORTATION LINES ON THE GREAT LAKES SYSTEM, 1951, a 73-p. Army Corps of Engineers report describing transportation lines and cargo carrying vessels of American registry operating on the Great Lakes system and their routes. Available from the Superintendent of Documents, Government Printing Office, Washington 25, D.C.

CHEMICAL PRODUCTS—EXPORTABLE SURPLUSES, third number of memorandum published by the Organization for European Economic Cooperation. Can be obtained from the O.E.E.C. offices at the price of \$2.

SUBJECT INDEX to volume 14 of the "Bibliography of Technical Reports" covers the period from July to December, 1950. The Bibliography is a monthly publication listing additions to OTS collections of foreign and domestic reports. From the Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C., at \$1 per copy.

RESEARCH AND RELATED SERVICES IN THE UNITED STATES DEPARTMENT OF AGRICULTURE, in three volumes, prepared for the Committee on Agriculture of the House of Representatives of the Eighty-first Congress. The report provides a factual statement and inventory of the research and related activities and programs of the Department of Agriculture—information which can be used in any study or analysis made of this work. United States Printing Office, Washington 25, D.C.

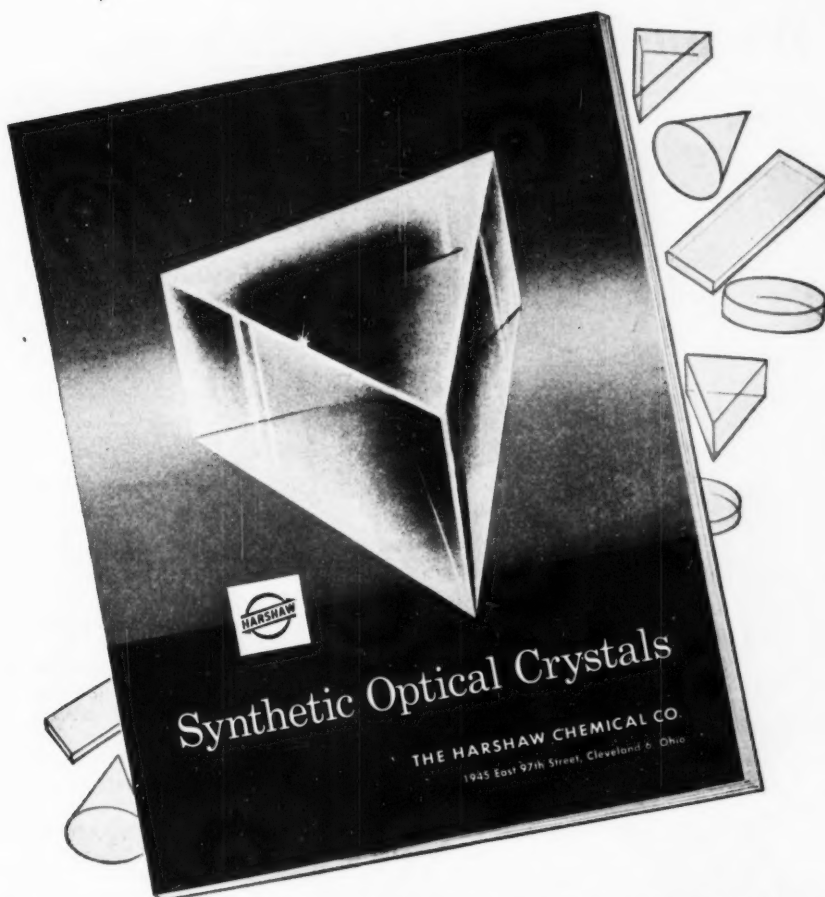
## MEETINGS . . . .

Canadian Gas Assn., annual convention. Bigwin Inn, Lake of Bays, Ontario, Canada, June 18-21.

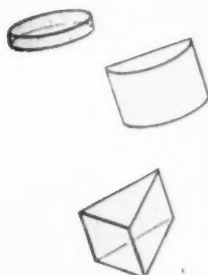
Chem. Inst. of Canada, annual conf. Winnipeg, June 18-20.

Amer. Soc. for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, June 18-22.

Summer Seminar in the Chem. of Nat. Products, Univ. of New Brunswick, Fredericton, N.B., July 10-14.



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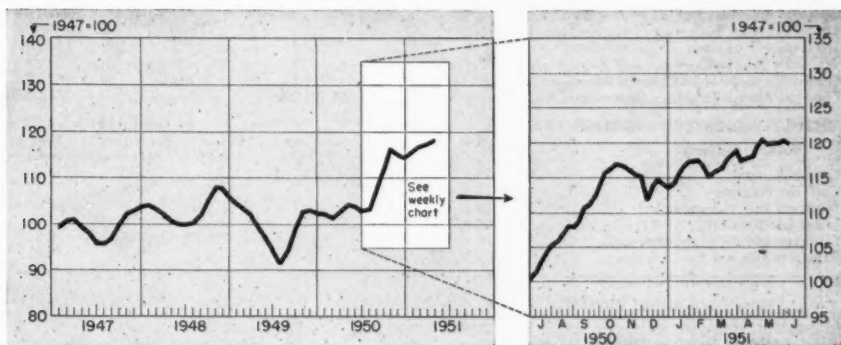
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# McGraw-Hill Publications

# CHEMICAL MARKETS....



CHEMICAL INDUSTRIES OUTPUT INDEX — Basis: Total Man-Hours Worked in Selected Chemical Industries

Slowly but steadily, chemical resale prices keep on going down. As long as chemical output remains constant, any signs of buyer retrenching means one thing—skidding prices.

At least part of the decline is due to band-wagon psychology, a reverse of the rush to overbuy following Korea that pushed prices to record heights. The decline, however, has been far more gradual than the headlong rise, and is still confined largely to resale.

Much of the resale market activity has leaned heavily upon the export trade. But many buyers from abroad, eyeing the downturn, have been holding off from present buying in hopes of still greater declines. The same attitude, but to a lesser degree can be found among domestic buyers.

Despite this trend, present indications point to a higher chemical demand in the latter part of 1951, and a general supply pinch before new defense-authorized capacity takes hold. Many who are now frantically trying to unload dormant chemical stocks, may regret their haste by next fall.

Here's how chemical exports loom: Government figures for the month of April show a gain of \$15.7 million, 25% above the March total of \$63 million. Biggest share of the increase for this period was snared by pharmaceuticals and industrial chemicals.

Corresponding import figures for April show only too well that prospects for greater supplies of needed chemicals are not materializing. Critically short coal tar products dropped in value from \$4.4 to \$4.0 million.

No supply relief is on the horizon for coal tar derivatives because of these dwindling imports. Benzene, naphthalene, maleic anhydride, phthalic anhydride, and tricresyl phosphate are as tight as at any time since Korea.

## MARKET LETTER



# MARKET LETTER

## WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	120.0	120.0	104.2
Bituminous Coal Production (Daily Average, 1000 Tons)	1,596.0	1,626.0	1,696.0
Steel Ingot Production (Thousand Tons)	2,063.0	2,063.0	1,927.0
Wholesale Prices—Chemicals and Allied Products (1926=100)	140.9	141.6	114.9
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	235.6	233.0	196.8
Chemical Process Industries Construction Awards (Eng. News-Record)	\$8,795,000	\$49,402,000	\$528,000

## MONTHLY INDICATORS—FOREIGN TRADE

(Million Dollars)	EXPORTS			IMPORTS		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	78.7	63.0	62.2	29.3	25.8	13.3
Coal Tar Products	6.1	5.0	3.1	4.0	4.4	1.3
Medicinal and Pharmaceuticals	23.8	18.7	16.5	0.6	1.0	0.6
Industrial Chemicals	12.3	9.3	8.1	13.5	11.1	1.7
Fertilizer and Fertilizer Materials	3.4	2.6	10.0	10.0	8.6	8.8
Vegetable Oils and Fats, Inedible	7.3	4.4	8.3	11.7	10.2	5.7

Among chemicals resisting the softening price trend are: resorcinol, aspirin, salicylic acid, phenacetin, and citric acid. Basic shortages and seasonal factors maintain buying pressure on DDT, allethrin, and pyrethrum for insecticides. Supply improvement is due shortly for citric acid, and sizable relief is anticipated for resorcinol and allethrin—but not until 1952.

Quick plunges from price peaks have been taken by sodium cyanide and sodium hydrosulfite. The cyanide price has been lopped to 28¢ from the 35¢ a pound value of the week before. Reason: heavier imports from overseas combined with demand letup.

Sodium hydrosulfite, lately coveted by foreign textile industry, also fell victim to petering-out demand. Result: a price drop from 63¢ to 44¢ a pound during the past ten days.

The export market for copper sulfate, strongest prop for the feverish resale activity of the last few months, has abated somewhat, but prices have not taken any noticeable drop from the 13½-14¢ a pound quotation. One major producer flatly states that there is plenty of copper sulfate for the domestic market, either for contractor or spot buyers, at \$8.95-\$9.95 cwt. depending on quantity.

Export demand keeps caustic soda in a firm market position, as South America, Indonesia, and India show continued interest. An unusual feature of the present trade: solid caustic is nearly 1½¢ a pound higher than flake because of foreign preference. Soda ash is on the plentiful side, prices ranging from 2¼¢ at Los Angeles to 1½¢ a pound higher in New York.

Government rulings have their effect on the chemical supply outlook. Tanning and leather chemicals will soon feel the results of the OPS meat price rollback. Industry ceiling prices (such as CPR-22) and the Controlled Materials Plan will have a considerable, if hard-to-gage, impact.

## SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending June 11, 1951

### UP

	Change New Price			Change New Price	
Carnauba Wax, No. 1 Yellow	\$ .015	\$ 1.32	Ouricury Wax	\$ .02	\$ .89
Cresylic Acid, imp., gallon	.05	1.57	Shellac, Lemon No. 1	.02	.55
Naphthalene, crude, imp.	.01	.11	Turpentine, gum, Savannah, gallon	.02	.78
Nickel	.06	.56			

### DOWN

Beeswax, refined	.01	.73	Stearic Acid, single-pressed	.02	.22
Copra, Pacific ports, ton	2.50	185.00	Tallow, fancy	.01	.14
Menthhol, nat. USP	.10	12.00	Tin	.07	1.29
Oiticica Oil, tankcars	.01	.30			

All prices per pound unless quantity is stated



PT BOATS: Korea raises plywood requirements and the latter's . . .

## Glue Needs Up Resorcinol

Call for resorcinol-formaldehyde resins—as a cold-set plywood adhesive and as a binder for rayon fabric and rubber—boosts resorcinol requirements.

New capacity will be supplied by one new manufacturer, Borden, and expansion by both Koppers and Heyden.

The defense emergency is spawning a 65% increase in resorcinol production capacity. Reason: Need for more cold-setting adhesives (resorcinol-formaldehyde polymers) for manufacture of plywood for PT boats and other military uses. Also, use of resorcinol-formaldehyde polymers in mechanical rubber goods, including tire fabrics, continues to expand as increased quantities of rayon and nylon fabrics are employed.

**Competition Enters:** For years, with the exception of Heyden's small, 300,000 pound-a-year producing unit, all domestic resorcinol has been manufactured by Pennsylvania Coal Products Co. and its corporate successor, Koppers Co., at Petrolia, Pa.

Koppers isn't talking but benzene is probably first sulfonated to benzene disulfonic acid, presumably by use of a large excess of sulfuric acid. The disulfonic acid is converted to the sodium salt of benzene disulfonic acid with sodium sulfite. Fusion with caustic soda forms resorcinol and sodium sulfite. Most of the sodium sulfite is sold to manufacturers of semi-chemical pulp. It could also be utilized by kraft paper producers—

but only at greatly reduced prices, since it would have to match the price of salt cake.

Pennsylvania Coal Products Co. was not the first producer of resorcinol in the U. S. Prior to World War I all material had been imported from Germany, but shortly after the outbreak Barrett Co. began production, principally for manufacture of dyestuffs and of Resinol ointment. This production ceased shortly after Allied Chemical & Dye Corp. was formed, and resorcinol manufacture was transferred to National Aniline. It was not until some time later that Pennsylvania Coal Products Co. went into the business. Du Pont has manufactured small quantities from time to time for dyestuff manufacture.

Estimated Resorcinol Production Capacity (M pounds/year)		
Company	Now	1952
Borden Co.		1,000
Heyden Chemical Co.	300	1,000
Koppers Co.	4,500	6,000
<b>Totals</b>	<b>4,800</b>	<b>8,000</b>

Prior to the Korean emergency, resorcinol was being produced at an estimated rate of 4.5 million pounds per year as compared with production of the order of 250,000 pounds per year in 1937.

**Where Did It Go?:** This tremendous increase can be accounted for by three items: (1) para-aminosalicylic acid; (2) resorcinol-formaldehyde resins for use as a pre-dip before impregnating rayon and nylon with rubber; (3) resorcinol-formaldehyde adhesives for use where a cold set is necessary, e.g., in bonding wooden members that are too thick to be heated.

Also stemming from the Korean imbroglio is a sizable increase in manufacture of the lead salt of styphnic acid (trinitroresorcinol) for use as a non-corrosive small arms primer.

1949 End-Use Pattern	
Dyestuffs	9%
Pharmaceuticals*	35%
Resins	23%
Rubber	13%

\* Hexylresorcinol and para-aminosalicylic acid.

The resin category (cold-set adhesives) is the war-baby that has pushed up production. The high price (67¢/lb.) of resorcinol-formaldehyde adhesives spells high-cost specialty. And such high costs can be borne only where the less expensive, heat-set phenol-formaldehyde adhesives (23-28¢/lb.) cannot be used, as is true in manufacture of structural plywood. Here the thickness of the sections prevents setting the glue by heat without overheating the wood.

To attack this problem of cost, Koppers has recently developed a lower-cost, cold-set phenol-formaldehyde adhesive (47¢/lb.). But even this product is not competitive with phenolic wood-bonding agents.

It is estimated that requirements of resorcinol-formaldehyde resin for bonding purposes may eventually reach a million pounds per month—five times the normal output. But to reach this figure even more plant capacity must be installed.

**Rayon-Rubber Binder:** When rayon or nylon is used as a tire fabric, it is dipped in a resorcinol-formaldehyde latex to prevent separation of the fabric from the rubber when in use. This application, started on a large scale in 1945, has been increasing rapidly, since more rayon and nylon fabric is being utilized in rubber goods manufacture each year.

Resorcinol use in dyestuffs and, possibly, hexylresorcinol are the only markets that don't have a high military priority. Thus, under NPA con-

## CHEMICAL MARKETS.

trol, instituted in April, their manufacturers have had to take the little that is left. All of the expanded production—all with a 5-year write-off—will be subject to NPA control.

For the immediate future, producers have only two problems: (1) trying to meet demands and (2) provision of sufficient quantities of critically short sulfuric acid and benzene.

For the long run, however, manufacturers only hope that the continuing increase in use of rayon tire cord and civilian usage of structural plywood will increase to the point where the augmented supply will be required without the aid of Mars.

### Butanol Gap Narrows

Many consumers in the surface coatings field today are contentedly reaping the benefits of the latest price reductions in fermentation-grade normal butyl alcohol and its chemical offspring, normal butyl acetate. Within a few days after Publicker Industries, Inc. knocked off 7¢ a pound on both products to make a new price of 28¢ a pound (tanks), Commercial Solvents Corp. and U. S. Industrial Chemicals, Inc. followed suit with a 1¢-a-pound decrease to the same level.

No such reduction has been made in synthetic normal butyl alcohol, derived from acetaldehyde. The price of synthetic appears to be standing pat at 17¢ a pound in tanks, with freight allowed. In the ranks of these producers are Carbide and Carbon Chemicals Corp., Tennessee Eastman Corp., and Shawinigan Chemicals Corp.

**Why So Different:** It may seem strange to the uninitiated that a price differential of more than 10¢ a pound should obtain for products meeting kindred specifications. But the chemical industry is studded with examples of this kind; viz., glycerine and ethyl alcohol.

Since the early 1930's when synthetic butyl alcohol began to compete with the fermentation product, economic factors have raised synthetic production to nearly double the output from fermentation. During the past two decades, the differential price curve shows more pleats than an accordion, with the fermentation grade usually higher by an amount depending on prevailing economic circumstances.

Synthetic producers have had one important advantage: reasonably constant raw material costs. Process improvements brought prices down as low as 8¢ a pound in 1939, but since World War II, soaring plant-equipment and operating costs have prod-

uced prices to the present mark.

Fermentation producers have been faced with problems of much greater complexity, since their raw materials—grain or molasses—have been price pawns of international trade. In recent years, grains have been expensive, and the shift has been to molasses.

**Past Performance:** If any price trend can be discerned, it is this: the price differential narrows when molasses is cheaper, or when consumer demand lets up. Thus, despite the fact that fermentation grade has usually been higher than synthetic, there were times in 1948 and 1949, when the prices were identical. In the first instance, Cuban molasses was dirt-cheap; in the second, there was a slump in lacquer demand.

In the frenetic buying since Korea, both fermentation and synthetic prices have zoomed—like almost everything else. Since the first of the year, an

active resale market has flourished, but the cream of this activity seems to have been skimmed off.

**Where They Go:** Whatever the source of normal butyl alcohol, the lacquer industry is still the kingpin market. In this category, nitrocellulose and urea-formaldehyde surface coatings take the lion's share; butyl phthalate plasticizers also take substantial amounts. In recent weeks, synthetic resins showed some signs of spottiness, but demand is now firmer.

In this arena, another factor must be reckoned with—sec-butyl alcohol, source of methyl ethyl ketone (MEK). At 11-12¢ a pound, MEK is competitive with butyl acetate.

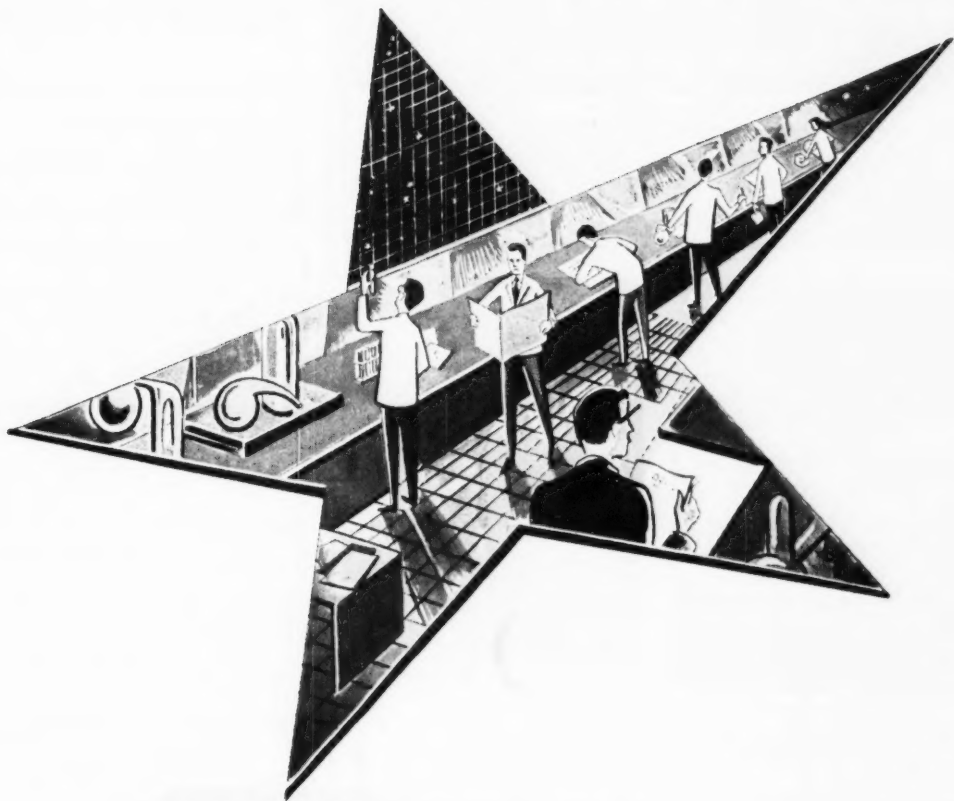
**Up Ahead:** For the foreseeable future, producers will have all the business they can handle. Consumers this summer won't have to scramble for supplies, but some occasional scouting may be in order later in the year.

## GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
<b>General Services Administration, 250 Hudson St., New York 13, N.Y.:</b>			
June 19	NY-2H-28459	26,000 containers	photographic chemicals
<b>Office of the Regional Director, General Services Administration, 1800 Fidelity Bldg., Kansas City 6, Mo.:</b>			
June 13	KC-15823	2,000 lbs.	calcium chloride, anhydrous granular
June 13	KC-15823	4 drums	weed killer, 35 gal. drums 2 dr-40 percent amine, 2 dr-ester
<b>General Service Administration, Sansome St., San Francisco, Cal.:</b>			
June 19	538	500 gal.	oil, linseed boiled TT-0-364
<b>Civil Aeronautics Administration, P.O. Box 5767, Indianapolis 21, Ind.:</b>			
June 22	166	4,000 lbs.	methyl bromide, commercial grade
June 22	164	1,000 lb.	bromochloromethane (CB)
<b>Armed Services Petroleum Purchasing Agency, Washington, D.C.:</b>			
June 20	51-47B	various	dry cleaning solvent and paint thinner
<b>General Services Administration, Washington 25, D.C.:</b>			
June 21	JM-337	5,580 gals.	disinfectant
June 14	5M-105-R	2,700 gals.	scaler, floor thinner enamel thinner, paint in 1-gal. and 5-gal. cans, in accord with Fed. Spec.
<b>Federal Supply Service, General Services Administration, 250 Hudson St., New York 13, N.Y.:</b>			
June 23	NY-2H-29369	360 lbs.	wax, floor
June 23	NY-2H-29369	3,360 qts.	wax polish, furniture
June 23	NY-2H-29369	8,400 qts.	wax polish, metal
June 23	NY-2H-29369	180 gals.	wax polish, furniture
June 23	NY-2H-29369	780 containers	wax polish, shoe

## GOVERNMENT AWARDS

Item	Supplier	Location
<b>The Navy Purchasing Office, New York, N.Y.:</b>		
calcium hypochlorite	Pittsburgh Plate Glass Co.	Pittsburgh, Pa.
sulfuric acid	Burris Products Co.	Stark Annex, Naval Base, North Carolina
sulfuric acid	Cole Laboratories	Long Island City, New York
<b>Navy Department Aviation Supply Office, Oxford Ave. and Martin's Mill Rd., Philadelphia, Pa.:</b>		
trichlorethylene, stabilized	Niagara Alkali Co.	Los Angeles, Calif.
degreasing		
liquid polymer compound	Coast Paint & Chemical Co.	Los Angeles, Calif.
trichlorethylene, stabilized	Detrex Corp.	Detroit, Mich.
degreasing		
phenol, commercial, U.S.P. grade	Crowley Tar & Chemical Corp.	New York, New York
<b>Armed Services Medical Procurement Agency, 84 Sands St., Brooklyn 1, New York:</b>		
chloromycetin	Parke, Davis & Co.	Detroit, Mich.
<b>Chemical Corps, U.S. Army, New York Chemical Procurement District, 111 East 16th St., New York 3, N.Y.:</b>		
hexachlorethane, class A	Canadian Commercial Corp.	Ottawa, Canada



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Caustic Soda	Other Uses).
Chlordane	Sulphur Chloride
Chlorine	Sulphuric Acid
Citric Acid	Tartaric Acid
DDT (Dichloro Diphenyl	Textile Stripper
Trichloroethane)	Titanium Tetrachloride
Ethylene Trithiocarbonate	Toxaphene (Chlorinated
Silicon Tetrachloride	Camphene)

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Apopka, Florida — North Portland, Oregon — Houston 2, Texas — Weslaco, Texas

# SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT:  
BUSINESS:

"OPPORTUNITIES"

EQUIPMENT  
USED OR RESALE

## UNDISPLAYED

\$1.20 a line. Minimum 3 lines. To figure advance payment count 5 average words as a line. Employment Wanted & Individual Selling Opportunity undisplayed advertising rate is one-half of above rate, payable in advance.

Box Numbers—Care of publication count as 1 line. Discount of 10% if full payment is made in advance for 4 consecutive insertions. Equipment Wanted or For Sale Advertisements Acceptable only in Displayed Style.

## RATES

Individual Spaces with border rules for prominent display of advertisements. The advertising rate is \$8.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured 1/4" vertically on one column, 3 columns—30 inches—in a page. New advertisements received by June 20th at the New York office, 330 W. 42nd St., N. Y. 18, will appear in June 30th issue subject to space limitations.

## DISPLAYED



**QUICK ACTION ON  
USED MACHINERY**  
FOR THE  
**CHEMICAL & PROCESS INDUSTRIES**  
Including Pulp, Food, Rubber, Plastics,  
Sugar, Drugs, Cosmetics and Allied Fields.  
From a single item to a complete plant.  
CASH FOR YOUR IDLE EQUIPMENT.

**CONSOLIDATED**  
PRODUCTS COMPANY, INC.  
14-18 Park Row New York 38, N. Y.  
BRaoklyn 7-0600



**GEAR  
UP  
FOR  
BIGGER  
PRODUCTION  
WITHOUT  
DELAY**

**GOOD USED  
EQUIPMENT**  
Ready for  
Immediate  
Shipment  
It's Impossible to  
List in this space  
the 5000 Machines  
available from your  
**FIRST SOURCE**  
Send for our  
Latest List

**FIRST  
MACHINERY  
CORP.**  
157 HUDSON ST.  
WOrth 4-5900  
NEW YORK 13, N. Y.

# MARKET PLACE

LOCAL STOCKS • CHEMICALS  
• RAW MATERIALS  
EQUIPMENT • SUPPLIES

**ETHYLENE IMINE**  
and some of its derivatives  
IN RESEARCH AND PILOT PLANT QUANTITIES  
Introductory brochure available;  
write for it on your letterhead

**CHEMIRAD CORPORATION**  
Bladensburg, Maryland  
Telephone Union 7894

# WANTED

**FLAKER WANTED IMMEDIATELY**  
Single drum flaker, stainless steel or chrome  
plated, preferably 48x40", with internal cooling  
and heated feed pan, variable speed motor drive.

W-9989 CHEMICAL INDUSTRIES WEEK  
330 W. 42 Street New York 18, N. Y.

- 1—Fletcher 30" Jr. Extractor, Imperforate  
Stainless Steel Basket, Expl. Pr. Motor  
—NEW.
- 6—Stainless Steel Kettles, 20# jkt., Vert.  
agitator—2700 gal. & 950 gal.
- 1—100 gal. Stainless Steel Type 347 Auto-  
clave, 18" x 9", 250# pressure, Elec.  
heated 850° F.
- 9—Aluminum Tanks, closed, 745 gal to  
1485 gal.

**PERRY EQUIPMENT CORP.**  
1521 W. Thompson St.  
Phila. 21, Penna.

**RUBBER LINED EQUIPMENT**  
Bird 40" x 60" Continuous Filter  
Bird 40" Centrifugal, Plow, Bottom Dump &  
Motor  
6' x 9' horizontal Pressure Vessel  
2—6' x 11' Tanks, Never Used

**WHAT HAVE YOU FOR SALE?**  
For Better Buys and Service  
Call South 8-4451—9264—8782  
You Can BANK on

**EQUIPMENT  
CLEARING  
HOUSE, INC.**  
289-10th ST., BRklyn 15, N. Y.

**TECHNICAL EXECUTIVE**  
Chemical engineer, experienced in production,  
research consulting and personnel management.  
Desires managerial post in company training  
programs, supervisory or advisory capacity in  
production or development in a chemical in-  
dustry. PW 9589 Chemical Week, 330 W. 42nd  
St., New York 18, N. Y.

# An Investment !

Productive advertising  
is an INVESTMENT  
rather than an EX-  
PENDITURE.

"Searchlight" advertis-  
ers almost invariably re-  
port prompt and satis-  
factory results.

BE CONVINCED —  
send us your advertise-  
ment TODAY.

Address Classified  
Advertising Division

**Chemical Week**

330 W. 42nd St., New York 18, N. Y.

**CHEMICALS WANTED**  
• Solvents — Pigments  
• Intermediates, etc.  
Highest Prices Paid

**Aceto**  
CHEMICAL COMPANY, INC.  
62 BEAVER ST., New York 5, N. Y.  
Dighy 4-9780

# PROFESSIONAL SERVICES

**EVANS**  
RESEARCH AND DEVELOPMENT CORP.  
Chemical Research • Processes • Products  
Development Problems  
Complete Laboratory • Pilot Plant • Mechanical  
and Critical Sections  
Ask for NEW Scope Sheet C listing over 100 of our activities.  
250 East 43rd Street, New York 17, N. Y.



# READER SERVICE . . . . .

## HOW TO USE COUPON

Circle page numbers of items about which you want more details. Then write your name and address on the coupon at the bottom of the page and mail it to us. Your request will be forwarded to companies concerned, the answer coming direct to you.

## MAKES IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

## THE NUMBERS

**Advertisements:**—There is a page number on the coupon for each advertisement. Before the number, may appear, L, R, T, B (left, right, top, bottom), locating the ad on the page; small letters following (a,b,c) indicate additional products in the advertisement.

**Editorial Items:**—Numerals are page numbers; the ABC's distinguish among items where more than one is on a page. There is a number on the coupon for each item referring to new products, equipment, and literature.

## EDITORIAL ITEMS

For more data, circle number on coupon

### TECHNICAL LITERATURE

#### Chemicals

Lacquer	48D
Polyethylene Films	48C
Silicones	48B
Surface-Active Agents	48A

#### Equipment

Bag Holder	48M
Centralized Lubrication	48I
Crushing Instrument	48G
Fan-Cooled Motors	48K
Magnetic Separators	48N
Nylon and Teflon	48L
Packings and Gaskets	48E
Power Transmission Drive	48H
Testing Instruments	48F
Variable-Ratio Speed Changer	48J

## PRODUCTS ADVERTISED

For more data, circle number on coupon

Air conditioning & refrigeration equip., temperature & humidity controlling cabinets	T36
Catalysts, ultraviolet	T30
Chemicals	
Acetic acid	22d
Acetone	22c
Albumin tannate, medicinal	B38e
Ammonium thiosulphate	6
Amylphenols	9
Aromatic	24
Berez	5e
Bicarbonate of soda	B21a
Coal-tar	28
Copper naphthenates	18
Detergent, santomerse 80	2-3h
Detergent & wetting agent, santomerse No. 1	2-3g
Dichloran	B38f
Diethylene triamine, booklet F-6136	31
Digitoxin	B38b
Distilled red oil	49c
Ester gums	5c
Fatty acids	
Booklet on handling, sampling & testing	49e
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For flavors & extracts	B30
Formaldehyde	22a
General line	T38, 45
Gluconic acid	10
Hydraulic fluid, pydraul F-9	2-3i
Intermediates, catalog	2-3b
Limed rosins	5b
Lithium compounds	T35
Maleic modified esters	5g
Menadione	B38a
Methanol	22b
Monobromated camphor	B38c
Monohydrate of soda	B21b

Muriate of potash	4
Nonyl phenol	1
Oils	
Gloss	5f
Neatsfoot	49d
Optical crystals, synthetic	39
Ortho-nitrophenyl	2-3a
Orthophenylphenol	2-3j
Pale wood rosins	5d
Phenol	32-33
Phosphates	1
Plasticizer, arneel	49a
Polyhydric alcohol for coatings	50
Propyl gallate	B38d
Sal soda	B21c
Sodium hydrosulphite	B35
Sterox CD, bulletin P-129	2-3f
White oleic acid	49b
Wood turpentine	5a
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(Classified Advertising)

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## READER SERVICE COUPON

Mail to Chemical Week, 330 W. 42nd St., N. Y. 18, N. Y.

NAME \_\_\_\_\_

POSITION \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY & STATE \_\_\_\_\_

### Editorial Items

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Expires September 16, 1951

# BOOKLETS . . . . .

## Chemicals

### Surface-Active Agents

48-p. technical booklet covering the nature, grades, properties and applications of surface-active agents including data given in tabular form on surface and interfacial tension values, wetting time, spreading coefficients, etc. Also included is card summarizing for each of 12 compounds, the chemical structure, recommended solvent, ionic activity, conditions of use and suggested uses. Rohm & Haas Co.

### Silicones

22-p. booklet telling the story of a group of chemical products that have recently become significant to industry—the silicones. Explaining what silicones are, and how they have been used, this booklet discusses each major property in terms of its sub-properties and typical applications based on these properties. General Electric Co.

### Polyethylene Films

32-p. booklet entitled, "Bakelite Polyethylene for Paper Coatings, Properties and Coating Methods," describes new development in coating paper called the extrusion-lamination process; contains data on properties of polyethylene films and review of the manufacture, properties and applications of polyethylene-coated paper. Bakelite Co., Union Carbide and Carbon Corp.

### Lacquer

Leaflet giving information on lacquer and pointing out that lacquer formulations will be considered for military applications even where synthetic enamels are now specified owing to the better availability of lacquer and the possible advantages of the hot-spray process. Hercules Powder Co.

## Equipment

### Packings and Gaskets

32-p. catalog illustrating and describing 95 packings and gaskets in firm's line with detailed explanations of construction features, service recommendations and size information on each; also contains charts showing specific recommendations for a wide variety of applications. Raybestos-Manhattan, Inc.

### Testing Instruments

16-p. catalog explaining and illustrating firm's line of testing instruments including volt-ammeter, wattmeter, power-factor meter and phase-sequence indicator as well as instruments used to measure magnetic fields, welding cycles, resistance, speed, viscosity and roughness. General Electric Co.

### Crushing Instrument

8-p. descriptive bulletin discussing crushing instrument which utilizes operating

principle of controlled impact action in taking up and reducing material to specification size in one operation; used in the production of aggregates for road building and concrete construction and simultaneous production of agline as well as other applications. Pettibone Mulliken Corp.

### Power Transmission Drive

16-p. illustrated booklet featuring power transmission chain drive based on new design principles which makes possible single drive units capable of transmitting as much as 5,000 horsepower, at linear speeds up to 6,500 feet per minute; applications include commercial fishing, petroleum, irrigation, chemicals, steel manufacturing and any other field where a heavy-duty, high-speed drive is required. Morse Chain Co.

### Centralized Lubrication

8-p. folder discussing centralized systems of lubrication for lubricating equipment mechanically; system features measuring valve which forces measured charge of oil or grease from central pumping unit to each bearing as frequently as desired. The Farval Corp.

### Variable-Ratio Speed Changer

Technical data sheet on Type 4B miniature variable-ratio speed changer, a unit especially useful in applications requiring remote or automatic control, finds application in timers, recorders, controllers, computers, indicating mechanisms and similar low power devices. Metron Instrument Co.

### Fan-Cooled Motors

6-p. folder describing types of construction and ratings of totally-enclosed fan-cooled motors with tube-type, air-to-air heat exchangers available in squirrel-cage, wound-motor and synchronous types for both horizontal and vertical installation. Allis-Chalmers Mfg. Co.

### Nylon and Teflon

Folder giving specifications and sizes for nylon and Teflon in the forms of rod, strip and tubing to be used in the electrical manufacturing, metalworking and chemical fields for machined or blanked parts. The Polymer Corp.

### Bag Holder

Bulletin describing bag holder designed to hold cloth or burlap bags at filling and packing stations, at outlets of dust collection systems, etc. B. F. Gump Co.

### Magnetic Separators

16-p. illustrated catalog entitled, "Non-Electric Permanent Magnetic Separators for Tramp Iron Removal," presents descriptions of separators, engineering data along with photographs, drawings and tabular specifications in addition to selection information and details on application engineering. Eriez Mfg. Co.

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**ARMOUR***Chemical Division***Fatty Acids****Long-Chain Fatty Acid Derivatives****Industrial Oils**

## Arneel Plasticizers Available for Prompt Shipment

Defense requirements have created shortages of many primary plasticizers. Fortunately, however, with the expanded facilities of their new plant, the Armour Chemical Division can offer Arneel Plasticizer for prompt shipment.

"Arneel" is the Armour trade-name for a series of 11 high molecular weight aliphatic nitriles having alkyl chain lengths of 8 to 18 carbon atoms. They are chemically stable nitrogen containing compounds represented by the general formula RCN where R is a normal aliphatic group.

Arneel Plasticizer is being used as an extender and in many cases as a primary plasticizer particularly where low temperature flexibility is desired. The Arneels are excellent softening agents for several

synthetic rubbers and elastoprenes and synthetic rubber-like elastics or elastoplastics. Arneels are particularly efficient softeners for acrylonitrile copolymers, polyvinyl and polystyrene derivatives. For certain polymers, 25 to 50 per cent less plasticizer is required to obtain the desired characteristics. Furthermore, the efficiency experienced with Arneel softeners permits compounders to carry a high load of carbon black or other reinforcing agent and thus reduce materially the cost of the finished product.

The Arneels offered commercially as plasticizers are readily available and can be obtained in tank car quantities. For additional information, write for your free copy of the booklet "The Arneels as Plasticizers."

## New Oleic Acids Improve Products

Low Temperature Solvent Crystallized Oleic Acids, introduced recently by the Armour Chemical Division, are already finding important applications because of their unique combination of properties. Not only does this process—exclusive with Armour—produce the highest quality and most uniform Red Oils and Oleic Acids available, but it uncovers many advantages not found in ordinary distilled or pressed products. It has lower saturated acid content, greater stability, and is ester-free and almost odorless.

In the manufacture of latex foam rubber, for instance, potassium oleate is used as a foam stabilizer. Here good odor is important in the soap product so that no clinging rancidity is present in the final product. Likewise, low unsaponifiable content is important if a uniform "blow" is to be obtained. Good mechanical and uniform chemical stability are also highly desirable if uniform gelation

is to be controlled. All of these properties are inherent in Armour's Low Temperature Solvent Crystallized products.

Recently, many foundries have turned to resin binders as a means of producing uniform sand cores. Here low-titer red oil dissolved in fuel oil or kerosene acts as a positive mold release from core boxes. Thus the time cycle of "loading" is reduced and rejections are consequently negligible. And, at the same time, mold build-up is greatly lessened.

The above are only two examples of where the superior qualities of Low Temperature Solvent Crystallized Oleic Acids have improved formulations. If you are dissatisfied with the products you are now using, or if you are looking for a safe and dependable source of supply for oils and fatty acids, it will pay you to investigate Armour's complete line of Oleic Acids and Red Oils. Specifications are listed in the chart below.

Product	Titer		Iodine No. (Wt%)		Acid Value		Sap. Value		Unsaponifiable	Color Max.
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
Distilled Red Oil (8°-11° Titer)	8°C	11°C	90	95	193	200	193	200	— 3%	6.4R-24Y (1° Lov.)
White Oleic Acid (8°-11° Titer)	8°C	11°C	90	95	195	201	195	201	— 2%	1.5R-15Y (5¼° Lov.)
Distilled Red Oil (Low Titer)	—	5°C	90	95	193	200	193	200	— 3%	6.4R-24Y (1° Lov.)
White Oleic Acid (Low Titer)	—	5°C	90	95	195	201	195	201	— 2%	1.5R-15Y (5¼° Lov.)

All of these products are available for prompt shipment in 55-gallon drums or in aluminum tank cars. Write today for prices, samples and additional information.

## Commercial Grades of Neatsfoot Oil Available for Prompt Shipment

In the processing of textiles and leather, neatsfoot oil plays an important role. It imparts a quality that no substitute cheaper oils can offer. For these industries, Armour Chemical Division produces several grades of neatsfoot oils—with the same degree of uniformity as lard oils. Here are the specifications of three of these oils:

### Prime Neatsfoot Oil

F.F.A.	5% Max.
Pour Point	40-45°F
Color	3 NPA Max.

*Ideal for use in knitting mills, this oil washes out readily and imparts a fine quality to the finished product.*

### Extra Neatsfoot Oil

F.F.A.	10% Max.
Pour Point	40-45°F
Color	4½ NPA Max.

### No. 1 Neatsfoot Oil

F.F.A.	15% Max.
Pour Point	45-50°F
Color	5 NPA Max.

*Both of the above oils are widely used as leather preservatives and softeners—also for rough textile work.*

## Recommended Reading

Write for the authoritative booklet "The Handling, Sampling and Testing of Fatty Acids" covering: Shipping and storing fatty acids; process equipment; standard sampling methods and equipment; testing fatty acids; tests commonly used and their meanings. Available without charge.

## Mail this Coupon

Please send additional information on

•  
•

Name..... Title.....

Firm.....

Address.....

City..... Zone..... State.....

**ARMOUR** *Chemical Division*

Armour and Company

1357 W. 31st St., Chicago 9, Ill.

***Toughness and Durability!***



**COATINGS FORMULATED WITH**

**PENTEK®**

Manufacturers of automotive and marine finishes get extra toughness and durability of film in their products through the use of pentaerythritol. That's why Heyden PENTEK is finding a steadily increasing demand as a preferred polyhydric alcohol for the production of alkyds, drying oils and varnishes.



**DIPENTEK®**

In addition to lasting beauty, fine gloss and easy-to-clean qualities, surface coatings made with PENTEK have high resistance to water and soap, highly important qualities in architectural paints and interior enamels.

PENTEK is shipped in 80 lb. multiwall bags. Write for samples and technical literature.

**TRIPENTEK®**

**Serving Industry Through Finer Chemicals**

Benzaldehyde • Benzoxoles • Benzyl Chloride • Bromides  
Chlorinated Aromatics • Cresoles • Formaldehyde • Formic Acid  
Glycerophosphates • Guaiacols • Hexamethylenetetramine  
Medicinal Colloids • Methylene Disulicylic Acid  
Paraformaldehyde • Parahydroxybenzoates  
Penicillin • Pentaerythritols • Propyl Gallate • Resorcinol  
Salicylates • Sulicylic Acid • Streptomycin

**HEYDEN**  
CHEMICAL CORPORATION

393 Seventh Avenue, New York 1, N. Y.

CHICAGO • PHILADELPHIA • SAN FRANCISCO • DETROIT • PROVIDENCE